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PANTHER (*Panthera pardus*)
IN DHOLKHAND,
RAJAJI NATIONAL PARK

Photo by : H. S. Maindoia



FORESTS ARE PRECURSORS OF RIVERS

Editorial

THERE is a mad rush towards cities; People of all hues are leaving serene and green rural environment and are crowding the cities. Life is supposed to be easier, jobs more rewarding, prospects brighter, entertainments and amusements unlimited. But the pleasures offered by the cities tend to fade-out soon. There is no challenge and the efforts to keep going overcome man's attempts to be creative. Life becomes boring and uncomfortable. His spirit is starved amidst the busyness of the city. His very breath sometimes gets suffocated by pollution, by too many people, by too many hassles. Work becomes more drudgery in order to earn money. Money then becomes the sole arbiter, whose unsatiable lust entangles us like a monstrous vine. Sometimes there comes a longing to get away from all this and where better to go than the forest?

John Rangihau, naturalist and philosopher, has well said; "when I go to the forest, I feel I am getting rid of my old skin and putting on a new one". The forest is as necessary to us as life, for in it we can recreate ourselves. We can find again the roots of our life in the soil, in the trees, in birds and beasts, flowers and ferns in worms and insects, in wind and the rain, in real communion with kindred spirits.

Trees like men are born, thrive, reproduce their kind, falter, fail and die. Then mushrooming seedlings and tall-straight saplings rise to take their place. This is Nature's eternal law.

Forests drink the rain, sway in the storm, whisper in the breeze. From forests comes the clear and cool water released ungrudgingly from the mantled hills for man's need. Water means purity, water is life.

But there is a lesson here for us. If we work against the nature, we can expect things to go wrong; but if we work with nature all will go well. Therefore, we should use our thoughts and words and do all our deeds with proper discrimination and reverence for the conservation of forests and the life which burgeons in them. In the preservation of forests and wildlife it is certain that conservation and development shall go hand in hand.

CONTENTS

1. Panther Vs Leopard	01
by I.S. Negi, I.F.S. (Retd.)	
2. Studies on ecological factors controlling the breeding habits of fresh water fish species at Jodhpur	07
by Anita Jhajhria	
3. The Birds of Malda District, West Bengal, India	15
by Samiran Jha	
4. Shooting Down the Wild Life Protection Act	32
by Dilip M. Naik, I.F.S.	
5. Status Survey and Ecology of Nilgai, <i>Boselaphus tragocamelus</i> around Jodhpur, Rajasthan	37
by A.K. Chhangani, A.K. Purohit and S.M. Mohnot	
6. The presence of <i>E. Coli</i> , as indicator species of Faecal pollution in Takhat Sagar	41
by G.R. Jakher and Mamta Rawat	
7. An Integrated Watershed Development Model For Ecologically Fragile Mountain Ecosystem	46
by S.S. Pharatiyal, Sanjeev Soti, Dalip Bhatia and D.P. Uniyal	
8. Sighting of Vultures	54
by A.M.K. Bharos	
9. A nature-Lover's Unnecessary Concern For Wildlife in Afghanistan	55
by Brig. R. Lokarajan (Retd)	
10. Joint Forest management (JFM) in Madhya Pradesh	56
by Dr. R.B.S. Kushwah	
11. ऊदबिलाव : मोम का पुतला	75
द्वारा: रामेश बेदी	
12. उत्तरांचल के वन्य प्राणी	82
द्वारा: जगदीश प्रसाद सती	
13. Save India's Last Environment	88
by Bulu Imam	
13. बधाई	90

Panther Vs Leopard

By

I.S. Negi IFS (Retd.)

Introduction

THERE is an old saying in Garhwal that "but for its tail a panther would hide under a Sakina (Indigofera pulchella) leaf. There is of course quite a bit of exaggeration in this phraseology, but the fact remains that panther has remarkable ability to hide itself under a thin cover of vegetation. Its colouring and black spots on the skin perfectly blend with the surroundings. Its flexible muscles help enlarge or reduce its size at will. Its hair raising, especially on the mane, gives it a terrifying look. These rare qualities help the panther in successfully prowling upon deer, dogs, monkeys and fowls. Spotted deer stags (Jhank), Sambar doe and even cattle heifers are not too large for it and often fall prey to panthers.

Panther is the second important species after tiger amongst the carnivores of Indian forests. It is found throughout India and has adapted to all types of forests and scrub jungles, from cool Himalayas to arid tract of Central India. In common parlance panther is also called leopard.

Controversy

Before we discuss the habits and habitat of panther it will be appropriate to make distinction between the panther and the leopard and whether or not there is a difference between the two. There is a never-ending controversy as to whether panther and leopard are one and the same animal. Most of the sportsmen and naturalists consider panther and leopard the same species and like tiger they divide them into varieties, depending on their size, habits and habitat. The biologists find no appreciable difference in the formation of the skull of typical specimens of

panther and leopard. Both the animals are found side by side, inhabiting the same kind of forest and locality. Any difference in size and colouration is imaginary. The size of the panther differs according to locality and the animal changes colour of the coat in different seasons.

Sanderson, a keen sportsman writes—
"The distinction between the panther and leopard is practically small and lies chiefly in the inferior size of leopard. The markings, habits and general appearance (except size) of the two are almost identical."

Dr. Jerdon, an expert, views that panther and leopard are near varieties of the same species. They differ greatly in size and the panther, in some cases, attains the dimensions of a small tigress, where as a leopard is not larger than a bulldog. There is no more radical difference between the two animals than that exists between horses and ponies. Their habits and haunts are almost identical and any difference that exists is mainly due to relative powers of the two animals. While the panther kills cattle as well as large deer, the leopard is content with goats, sheep, dogs, hares and fowls. Leopard is often called by hill people as *kukria bagh*, ie, a dog lifter.

M.D. Chaturvedi, the doyen among foresters and wildlife experts, in his book "Panther on the prowl" writes that the naturalists of the nineteenth century (Sykes, Elliot, Horsfield, Hodgson and Sterndale) considered the panther and leopard as two distinct species, relying mainly on minor variations in size, shape of the skull, colour, density of fur and dispersal of spots. Since they belong to cat family, Linnaeus called the panther as *Felis pardus* and Temmirick called the leopard as *Felis leopardus*. In 1930 Pocock gave the name *Panthera pardus fusca* to the common Indian panther, which has now come to be considered as synonymous with leopard.

Nailing down the controversy Chaturvedi writes "The average sportsman will do well to be content with the name *Panthera pardus* and not

worry himself with hair-splitting distinctions indulged in by the naturalists. The thing to remember is that there is no significant difference between a leopard and panther. These are but two names of the same species. This view finds support in the critical studies of both Blyth and Blanford and has the blessings of modern mammalogists."

Differentiation

But still there are quite a large number of people, including naturalists and sportsmen, who believe that panther and leopard are two different species with marked distinction in size, coat, coloration and shape of the skull. Sir Walter Elliot remarked that the strongest difference of character is in the skull, that of panther being longer and more pointed where as the leopard has not only a rougher coat and the spots being more blurred but it is a more squatly built animal with a rounded skull.

However, to set the controversy at rest it will be safe to assume that panther and leopard are near varieties of the same species *Panthera pardus*, living side by side and sharing almost the same habitat. Therefore, for all practical purposes we shall refer to the larger variety as panther (*Panthera pardus*) and the smaller one as leopard (*Panthera leopardus*). Panther which dwells in deep forests where prey animals abound acquire larger dimensions and brighter coat, whereas the leopard which lurks

around human habitation and hunts the sheep and goats and lifts dogs remains smaller in size and lighter in built. Similarly panther found in *bugials* (alpine pastures) is larger in size with far more majestic gait than the one found in plains forests. In 1969, this author while trekking down the Malan valley, a wildlife sanctuary in Lansdowne Forest Division, came across a huge panther in the middle of the sanctuary and just after an hour's walk down to village Kalalghati (Kanva Ashram) saw a leopard sitting on his hind legs and waiting for the stray cattle to come home at dusk. The two animals were so different in size; coat and colour that it was hard to believe that both were one and the same species. The smaller variety of panther forms about seventy five percent of the whole species and though there may be some difference in the formation of the skull of the two varieties the smaller is only a miniature model of the larger, resembling the latter in every respect as regards markings and general temperament and differing only in size and the nature of the area inhabited.

Size, Colour and Coat

The panther varies in size from six to eight feet from nose to tip of the tail. A full-grown panther is not far inferior in size to the mediocre tigress. But as regards the agility, boldness and general viciousness, it far surpasses the tiger. The coat is generally pale, orange yellow or reddish fawn with dark spots grouped

in rosettes except on the spine and towards the extremities, where they are distinct black marks. Fir is short and close. The ground colour is lighter in older animals.

The leopard also varies in size but does not exceed six feet in length from nose to the tip of the tail. It is stouter, in proportion to its size, than the panther. The spots are more crowded and the fir is longer and looser than in panther.

Habitat

Panther usually lives in forests with thick undergrowth or in ravines overgrown with long grass and not in scrub jungle or caves as does the smaller variety, we may call leopard. The larger variety of panther is generally seen in thick forests far away from human habitation. It relies mostly on game animals for its prey; but will not miss the opportunity of killing a cow or bullock if found in the jungle. But as a rule it is not as bold as the lesser variety and often hesitates in killing a goat out of the herd grazing in the forest with an alert attendant. Also a panther is not the stealthy sneaking beast that prowls around villages eyeing every goat or pie-dog. Due to its bulky and bright body it often reveals its presence near village steads.

Habits

Though a heavy animal the panther finds no difficulty in climbing trees. Its sharp and strong claws help in firmly

gripping the trunk of trees. It very often climbs the trees and lies along a thick branch over hanging some well frequented game track to pounce on any unwary deer or pig that may happen to pass underneath. Panther prefers ambushing an unwary prey rather than chasing it over long distances.

The smaller panther (leopard) is not concerned with the presence of man and mostly relies on its small size to hide and sneak out of the view. At night it prowls boldly around the villages and does not hesitate to even sneak in and out of the streets in search of dogs and goats. The cunningness and capability of panther to stealthily move through the crowded streets of villages make it possible for them to snatch dogs out of every house. Villages situated near the panther-haunted jungle are almost denuded of dogs. The goat and sheep herds also have bad time as the flock is constantly thinned by the leopard, either while grazing at the fringe of the forest or when shut up for the night in their poorly built sheds, which as a rule are located in the suburbs of the villages. The leopards quite often help themselves to even poultry if they can reach them. Though their prey consists of goats, sheep, dogs and fowls, the panther can easily kill big heifers, undersized bullocks and if two are working in tandem they would kill a bullock or a small buffalo.

Method of Killing

The method of killing their prey by panther is quite different from that of the tiger. All small animals are pounced and

strangled to death by being gripped by the throat. There is a common belief among the villagers that the panther punctures one of the major veins of the throat with its sharp teeth and sucks the warm blood of its kill. This may or may not be true but the panther has often been seen licking the oozing blood from the throat of their fresh kills. The larger animals, such as bullocks, are seized by the muzzle and pulled down. The prey gets suffocated and is done with. Unlike tiger there is no attempt at dislocating the neck. Both varieties of panther start eating on the chest, stomach or shoulders of their kills. The female of the panther has often been seen eating on the udder of cows, especially the milch ones.

Crafty Animal

Panther is a crafty animal and has been known for surreptitiously entering cowsheds either by unchaining the doors or dislocating them. The older people in the hills bear testimony that panther sometime used to enter the cowshed from rooftop after removing loose states of the roof and making an entrance from there. But they also say that the panther would first insert its tail through the hole thus made in the roof as a feeler and if the tip of the tail touched the floor it would jump in, otherwise would not run the risk of jumping down a place where from it could not come out. It used the tail as a yardstick to gauge the depth of obstacle to jump out. Before venturing on any exploit the panther makes sure that there is a safe escape from the scene.

Cunning and Viscious

The panther is a cunning and vicious animal. The terrible ferocity and viciousness of panther, when wounded is well known to sportsmen. In most of the cases a wounded panther will charge the man than run away and will try to inflict as much damage with its teeth and claws in as short a time as possible, consistent with its line of retreat being assured. But a wounded panther is likely to become man-later. Even if the wounds have healed and the animal has regained normal health, it would attack a human being unwittingly. Women cutting grass or collecting fuel in the jungle or children tending cattle in the forest often fall victim of a man-eating leopards.

Man-Eaters

The man-eating leopards are mostly of larger variety. They live in the interior of forest, away from human habitation and mostly prey on game animals. But when they grow old and are incapable of killing the agile game animals, they turn to domestic herds. And when resisted or awed by the villagers protecting their cattle they attack the man. The larger panther is more conscious of his strength and has more confidence in himself and rarely give away before man. A panther sometime or the other tempted to attack an unwary boy tending his cattle in the jungle suddenly kills him and from then onwards, becoming conscious of his power, takes to man killing and man-eating.

Of late the instances of panthers turning man-eaters have become very common, especially in Uttaranchal. A man-eating panther becomes so pervasive that one single animal would make the life of the inhabitants of a large area miserable. He creates such a reign of terror that no one feels safe after dusk and a haunting fear takes possession of all. Doors are shut and where the walls of huts are made of thatch the inmates keep night long vigil with lighted fire. The hours of darkness are horror to these unfortunate people as it is then that the cunning brute is at work and on the look out for a sleeping and unguarded victim, snatching a women or child from the hut. In some cases the inhabitants are forced to desert the villages and flee to safer places.

More Dreaded Than Tiger

A man-eating panther is more dreaded than a man-eating tiger as the later will stroll in the forest day and night and pick up either a solitary person or snatch one out of a party, but the panther will wait for the night fall before he sets to work seeking his prey in the inhabited area of the village itself. Panthers mostly attack by night as they prefer pouncing on a sleeping and totally unprepared victim. It will be worth mentioning here that panthers mostly attack women and children and do not dare to attack adult males. The only instance of killing adult male by a panther in this part of country is found in Jim Corbett's book "Man eating leopard of Rudraprayag". But the old and physically weak pilgrims, walking bare

foot on rough and dusty foot paths (there was no motor road then) from Hardwar to Badrinath in the scorching heat of May-June, tired and exhausted and lying along road side on *yatra* route, were as good as dead.

Dodger Par Excellence

A man-eating leopard is a very cunning animal and like tiger it is always on the move, placing vast distances between the scenes of his different killings. To day it will kill a man here and tomorrow at a place 20 miles away. This makes it a very difficult business to bring a man-eating panther to book. In spite of rewards placed on his head by the government, he continues for months and sometimes for years to elude attempts to bring him to bag.

The man-eating leopard of Rudraprayag operated for 8 years (1918-1926) over an area of 150 square miles and killed as many as 155 human beings in 80 villages. Another notorious man-eating leopard killed or mauled more than two dozen people in late forties, in Bironkhal area of district Garhwal and tormented the entire population of nearly 200 villages for good three years. In 1951 the man-eating leopard of Narainbagar in district Chamoli spelt a reign of terror and killed a dozen people over a period of nine months. A man eating-leopard is indeed a divine curse

on the people of the area where it operates.

Breeding

Though there is no particular breeding season of the panther but the cubs are generally seen in the month of March. The gestation period is about three to three and a half month. The litter normally consists of four cubs, out of which two survive and not more than one reach maturity. The young ones are born blind and the mother zealously guards them till they are big enough to fend for themselves. The natural enemies of panther cubs are hyenas and jackals.

Prohibited Species

Panther has also suffered due to loss of habitat and dearth of prey animals. It was mercilessly shot in the past for skin, which fetched fabulous price in Western market. It has now been declared endangered species and is included in Schedule I of the Wildlife (Protection) Act of 1972. As a consequence of the protection afforded to it, the population of panther has increased and at places, especially in hills of Uttaranchal, it has acquired menacing proportions. The panther is a versatile animal and is quite adaptable to changing environs. It enjoys a much wider distribution than the tiger, which helps him to stand in good stead and ensure his survival in perpetuity.

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Studies on ecological factors controlling the breeding habits of fresh water fish species at Jodhpur.

By

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Introduction

Cyprinus carpio, *Labeo rohita* and *Cirrhinus mrigala* although attain gonadal maturity in ponds, normally do not reproduce in such an environment, but spawn in the natural riverine habitat. However, the major breakthrough achieved during the fifties in induced breeding through hypophysation has given a thrust to mass production of quality spawn in a controlled environment, thereby reducing the dependence on the natural seed collection.

The use of various synthetic formulations like ovaprim has largely replaced the use of pituitary glands in induced breeding (Ayyappan, 2000)

Material and methods

The brood fishes of rohu, mrigal and common carp were collected by operating the cast and drag net from the local ponds and lakes of Jodhpur. These were then transported in the happa to the hatchery unit of the Zoology Department.

The brood fishes weighing 1.5-5 kg were chosen and were acclimatized for seven days by feeding them twice daily with rice bran + oil cake, (1:1). Ripe males with milt oozing freely and females with soft bulging rounded abdomen and with reddish vent were selected for the breeding purpose. A male carp can be easily distinguished from the female during the breeding season by the roughness of the dorsal

surface of its pectoral fins compared to the smooth surface of the female (Jhingran, 1983).

Ovaprim, a ready-made drug in solution form contains calibrated amount of 20 µg of salmon gonadotropin and 10 mg of dopamine antagonist dissolved in an organic solvent (Garg *et. al.* 2000). It was injected intramuscularly towards the caudal peduncle region at the rate of 0.5 ml/kg of brooder weight. The abiotic parameters were studied by following the methods from APHA, 1985.

Results and discussion

Table 1 depicts the 21 controlled induced breeding exercise which were

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questionnaire was prepared for generating village-wise information on demography, habitat, crop rading behaviour, food preferences, reaction of villagers towards these animals and such other issues concerning its ecosystem in which the nilgai survives. Besides this scan sampling method and ad-libitum sampling methods (Altmann, 1974) were also used to collect additional information. Total 70 questionnaires were completed from 7 villages and 10 interviews were held in each village. These surveys and interviews were undertaken from 8.10.93 to 26.10.93 and from 15.1.94 to 20.2.94 covering 7 villages. About 512 hours were devoted to this study.

Results

Two basic types of herds observed are bisexual herds and all-bull (male) herds (Plate 1A &B), but some solitary bulls are also seen. Bisexual herds size ranges from 4 to 15 individual (average 6 animal) and all bull herd size varies from 2 to 10 individual (Average 4 animals). The results presented here are based on surveys conducted in villages Gopasaria, Rinia and Bhikamkor in Osian tehsil and Daijar, Boranada and Laccha- Basni in Jodhpur tehsil and Artiakallan in Bhopalgarh tehsil of Jodhpur district. (Table-1).

Table 1- Nilgai population in relation to village lands including common lands (figures in hectares).

S. No.	Name of village	Village (Total area)	Oran (Village Forest)	Gochar (Village pasture)	Part (waste lands)	Number of herds	Nilgai population
1.	Bhikamkor	22500	666.6	1666.6	20.0	7-8	40-45
2.	Rinia	3500	31.5	26.5	23.33	5-8	50-60
3.	Gopasaria	3200	33.5	8.3	3.3	6-8	30-35
4.	Daijar	2400	33.3	333.3	800	4-5	55-65
5.	Lochha Basni	5625	76.6	16.6	16.6	5-7	30-35
6.	Boranada	3775	19.3	10.65	20	4-5	40-45
7.	Artiakalan	4200	16.6	50	27.5	8-10	25-35

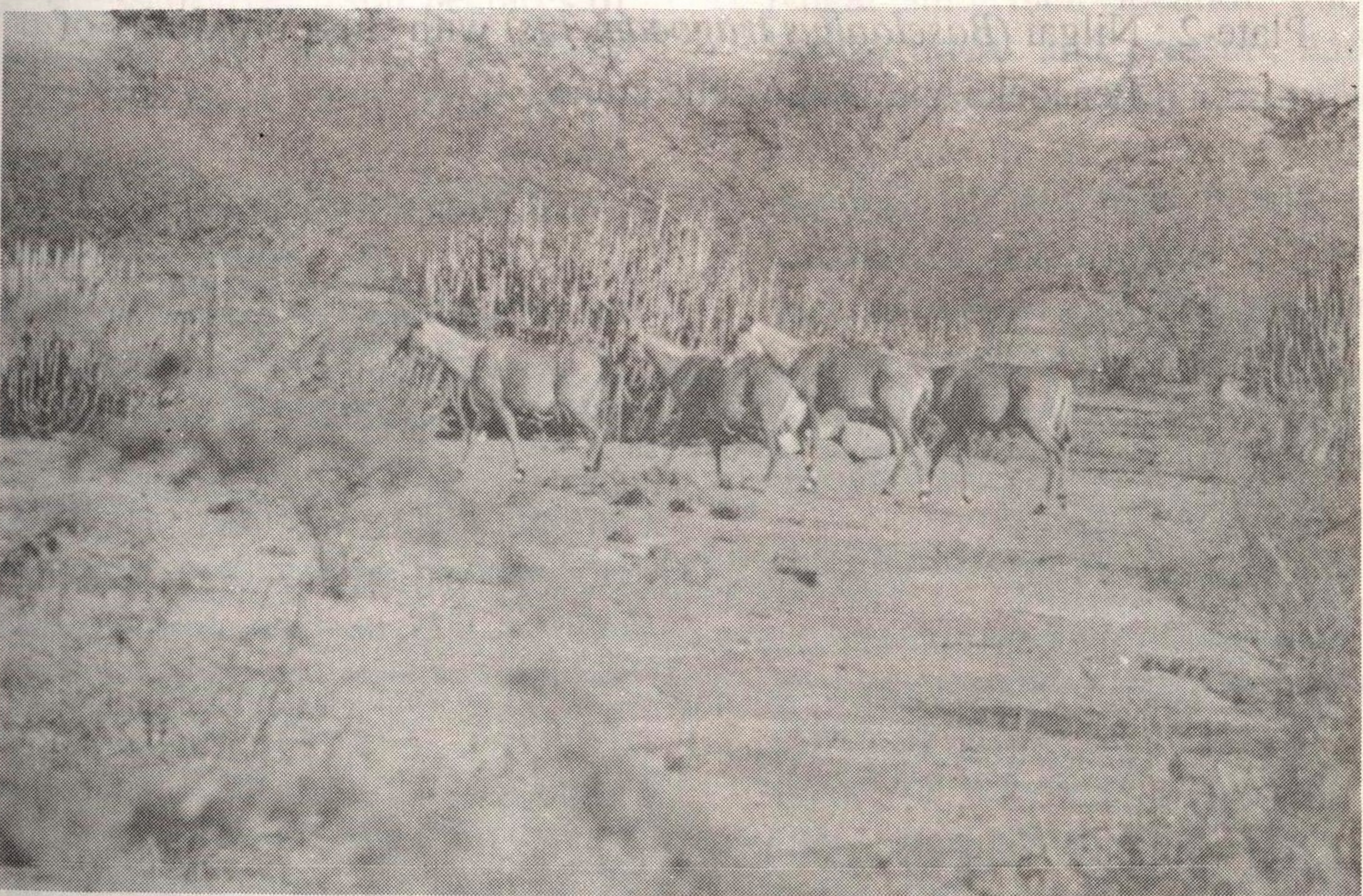
(i) The Presence of Nilgai in villages

The Presence of Nilgai, herd size and their population in relation to

village area and commons Oran, Gocher and Parat is presented in Table 1.



(A) Male Heard



(B) Female Heard

Plate-1. Association of Nilgai (*Boselaphus tragocamelus*) with hillocks for natural food and shelter



Plate-2 : Nilgai (*Boselaphus tragocamelus*) with close proximity of Peacocks and Demoiselle crane.



Plate-3 : A Nilgai calf chased by pair of Dogs at Daijar

The results of village surveys and interviews regarding the availability of nilgai herds, show that the physiography, climate, soil profile and vegetation was almost the same in the areas surveyed. However, of these 7 villages Rinia and Daijar had hillocks within their village boundaries while in the remaining 5 villages, like Bhikamkor, Gopasaria, Lachha-Basni, Boranada and Artiakallan there were no hillocks. This survey suggests that natural vegetation and availability of hillocks are important parameters to hold these animals (See plate-1A) compared to open lands and less natural vegetation. Further, in village Bhikamkor with about 22,500 hectares of land and with over 2300 hectares of commons like oran and gochar there were only 7-8 herds with about 40 to 50 animals. The whole area is by and large non-irrigated rainfed Kharif area.

Village Rinia and Daijar with about 3500 and 2400 hectares of village land respectively hold more animals than Bhikamkor probably because of more natural vegetation and more biomass as forage besides the protection Nilgai gets in and around the hilly areas. Here, neither agriculture nor human habitation exists. Village Rinia is primarily single crop area yet it holds large number of herds in a small area while Daijar a 2-crop area holds less number of animals. It is, therefore, difficult to correlate availability of Nilgai in relation to land area as well as agriculture land of a village.

(ii) The moving range of Nilgai

In this survey a definite pattern of nilgai territory and home range were lacking. Most of the people reported that the Nilgai herds move in a wide area covering the entire village forest and common land. The herds often change their location, which is directly related to availability of food and protection to some extent. At the same time these herds show preferences for certain areas. For example, they move in areas where they get food, shelter, protection and little or no human interference. Their night lodgings are always away from the village.

Villagers also reported that the Nilgai shift their location only under human threat and pressure and where natural resources like water, food and forage are in short supply for their survival. It has been found that the reasons of Nilgai shifts is linked with lack of movements and foraging sites in their traditional home range. This is because of over grazing, urbanization and increasing agriculture activity.

(iii) Food preferences

(a) *Natural food*: Nilgai is a well-known voracious herbivore, which is primarily grazer as well as browser. It feeds on variety of natural xeric plant taxa, particularly the trees, shrubs, herbs and grasses which are often avoided by other animals like, Kumbat (*Acacia senegal*), Babool (*Amilotica*), Khejri (*Prosopis cineraria*), Vilayti babool (*P. juliflora*), Kankara (*Maytenus emerginatus*) Rohira

(*Tecomella undulata*), Neem (*Azadirachta indica*) Pipal (*Ficus religiosa*) Bordi (*Ziziphus mauritiana*), Jhar ber (*Z. numularia*), Aak (*Calotropis procera*), Gangan (*Grewia tenax*), Thor (*Euphorbia caducifolia*), Ker (*Caparis deciduas*), Dhaman (*Cenchrus setigerus*), Sevan (*Lasiurus indicus*), Bui (*Aerva persica*), Siniya (*Crotalaria burhia*) and Dub (*Cynodon dactylon*) etc. Such food habits made the blue bull a hardy animal which can survive in adverse environmental conditions.

(b) Cultivated Crops: Ganwar (*Cyamopsis tetragonaloba*), Genhu (*Triticum eastivum*), Chana (*Cicer arietinum*), Moong (*Phaseolus radiatus*), Rizka (*Medicago sativa*), Makka (*Zea mays*), Moth (*Vigna aconitifolia*), Ganna (*Saccharum officinarum*), Kakri (*Cucumis sativus*), Tamatar (*Lycopersicon lycopersicum*), Band gobi (*Brassica oleracea* L. Var. *Capitata*), Ful gobi (*Brassica oleracea* L. Var. *botrytis*), Matira (*Citrullus lanatus*), Amrood (*Picidium guajava*), Anar (*Punica granatum*), Papita (*Carica papaya*), Hajara (*Tagetes erecta*) and Gulab (*Rosa indica*) are favourite food of Nilgai.

Without exception every one in the village reported that Nilgai causes considerable damage to their standing crops as they raid crops quite frequently. Amongst the agricultural crops they like *Moth*, *Garwar*, *Moong*, *Til*, *Gehun*, *bajara*, *Jeera*, *Dhan* and a variety of vegetables, which are grown in the area. Of these, *Gehun* is

the most preferred grains as they frequently raid wheat fields and eat before grain ripens. *Raira* is the least damages crop amongst the vegetable and fruit trees. It was found that they do not miss any opportunity to invade cabbage and tomato fields.

Chillies do not attract them while *Dhan* is their most favourite vegetable. It was observed that they repeatedly attack *Dhan* fields in spite of full vigil and protection by the field owners. This suggests that they prefer *Dhan* the most. They are probably attracted by its smell. Amongst horticulture, the grafted *Ber* is the most common victim because of their large-sized leaves and fruits. They also like local fruits grown in the agriculture fields like *Matira* and *Kachara*. The adult animal consumes on an average 15 kg of plant material in a day.

(iv) Nilgai and the fertility of soil

When the question of fertility of soil was posed to villagers the responses were interesting. While all villagers responded positively that the droppings and urine of Nilgai increase the fertility of soil, but claimed that this benefit does not accrue to their fields because these droppings are concentrated only at certain fixed locations within their home range, which are usually outside their agriculture fields. Some time they bring the faeces of Blue bull from the fixed locations of dropping sites and put in the agricultural fields. This does suggest that the areas, which they frequently visit, are enriched because of their faeces and urine. The extent to

which soil fertility increases needs qualitative and quantitative investigation.

(v) Inter-species behaviour

In the past nilgai have been very shy since they used to keep themselves away from human habitation. They used to avoid mixing with livestock as well. But, in the recent past with the increasing encroachments on their traditional rangelands, they are regularly coming in contact with village livestock and human beings. This has made them bold and aggressive with little fear and flight. Besides their interaction with goat, sheep, camel, cow and buffalo frequently brings them in contact with blackbuck, chinkara and a variety of birds including peacocks, demoiselle cranes in a close proximity (plate 2). Some times chasing of young ones by wolves and dogs was also observed near Daijar and Bhikamkor villages (see plate-3) However, in the normal situation they do keep certain distance from human beings which ranges between 50 to 100 feet as the minimum.

(vi) People's feeling on Nilgai

By and large, villagers were unhappy because of the presence of nilgai around their fields. Villagers' fears are justified because their crops, vegetable fields and orchards are often invaded by them, which causes considerable damage as claimed by them. It seems that they eat less and destroy more because of their massive body and random movements.

When asked about the question of fighting out this menace, 78.5% of them were of the opinion that they should be driven somewhere else. While 5.7% suggested that they should be killed. But most villagers do not want to kill them because of the religious sanctity this herbivore enjoys. The name Nilgai or blue bull or blue cow receives emotional protection of people. 1.4% of them were of the opinion that this powerful animal should be domesticated and used of draught purposes. It was also suggested by 14.2% villagers that males be castrated, using latest biological management techniques to control their population.

Discussion

The preliminary study suggest that the nilgai have very wide moving ranges and their herds move from one place to another and shift their lodgings giving the impression that the Nilgai population is increasing and causing lot of damage. The survey of 7 villages amply suggests that these animals are living on the outskirts of the villages, which are single Kharif crop areas. During Kharif season with the onset of monsoon these animals have fairly abundant vegetation in wild and will probably not raid the crops as they are exclusively herbivorous and fully survive on plant material.

Of the 7 villages surveyed only very limited area is under two crops that is both the Kharif and Rabi. It seems that the extension of agriculture in the recent past intercepted Nilgai's traditional moving routes and foraging

areas on the outskirts of the villages. This forces them to invade the fields occasionally while they are on their foraging journeys.

This study also suggests that their preferences for the natural vegetation and to keep it in undisturbed condition is a usual practice. Their association with hillocks is also evident. During and after monsoon their visit to the crop fields decreases considerably and suggests that in the normal circumstances they also keep themselves away from crop fields. It is clear from the present data that Nilgai do not want to come in contact with human beings and if they raid agricultural crops, vegetable fields or orchards they have to encounter humans and face a tough situation not conducive for their survival.

The crop raiding behaviour and preferences to certain crop material suggest that this is a recent development since they are eclectic feeders. That means they reject plant material for which they have not

developed any taste and eat those parts for which they have developed certain taste.

Their population size in the surveyed village does not suggest any alarming situation as has been claimed by villagers. The whole area is devoid of large predators and the small cat and dog family members, who are present to some extent, cannot kill these hefty herbivores (except young ones). This seems to be the major factor for slight population increase and imbalance in the ecosystem in which Nilgai is living.

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The Birds of Malda District, West Bengal, India

By

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Introduction

Over 500 species and subspecies of birds have been recorded in the Indian state of west Bengal (Majumdar et.al.,1992), Previous ornithological field work in West Bengal has been confined either to Southern West Bengal (Ball 1874, Saha et.al. 1971, Gauntlett 1986) or to the extreme Northern Bengal (Inglis et al. 1920, Lister 1954, Allen et al. 1997) and the areas of central West Bengal suffered even greater neglect at the hands of ornithologists. Information about the birds of Malda District, which lies in the central West Bengal has not previously been documented. The first attempt to document the list of birds of the area was made by Pemberton (1854) in the course of his revenue survey in the middle of nineteenth century. But the inclusion of Rook (*Corvus frugilegus*), Eurasian Jackdaw (*Corvus monedula*) and some other species in his list makes it doubtful. The second attempt was made by Carter (1935) who described Malda as a small game hunters paradise. His list includes threatened Swamp Francolin (*Francolinus gularis*), Bengal Florican (*Houbaropsis bengalensis*), and even the extinct Pink-headed Duck (*Rhodonessa caryophyllacea*). More recently P.K.Das on behalf of Zoological Survey of India made a short collection trip to Malda between 1979-88 (Majumdar et al. 1992). Name of Malda District has frequently come into the Ornithological literature in connection with the distribution of certain species e.g.. Bengal Florican (Baker, 1935), Glossy Ibis (*Plegadis falcinellus*) (Ali, S & Ripley, S.D., 1987).

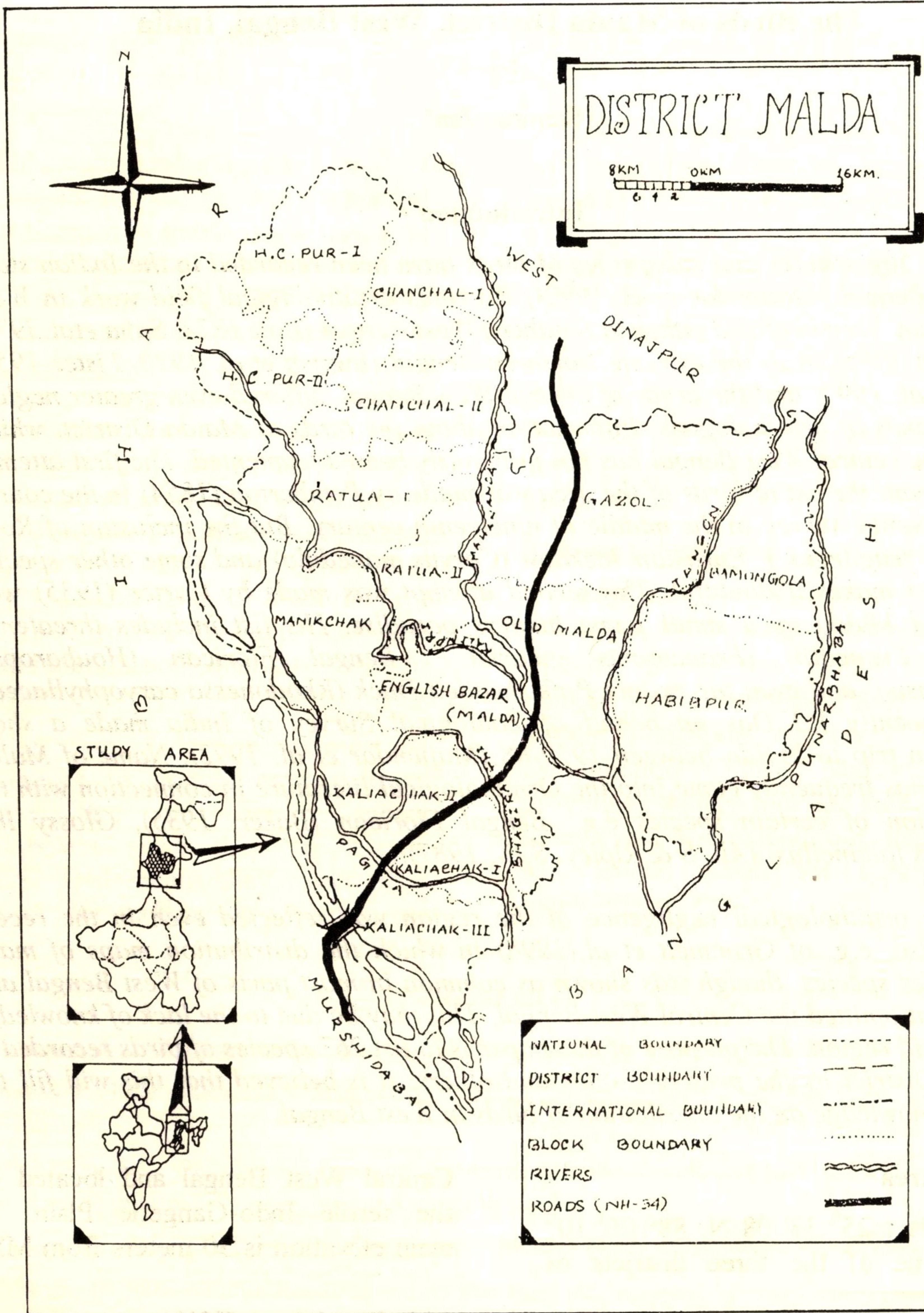
Such ornithological negligence of the region was reflected even in the recent works also, e.g. of Grimmett et al,(1998) in which the distribution maps of many commoner species, though was shown as common in most parts of West Bengal and India, but omitted the Central West Bengal. This may be due to the lack of knowledge of the said region. The purpose of this paper is to list 267 species of birds recorded in Malda District by the present author and others. It is believed that this will fill the gap of knowledge on the distribution of birds in West Bengal.

Study Area

Malda (25° 33' 08 N, 88° 20' 10" E) is one of the three districts of

Central West Bengal and located on the fertile Indo-Gangetic Plain. Its main elevation is 30 meters from MSL

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and have an area of 3713 Sq. Km. (Chakraborty, S.K. 1990). The river Kalindi and Mahananda have divided it into two distinct soil areas e.g.. Diara and Barinda (Sengupta, 1969). Diara is a special type of habitat in a riverine environment and these are newly formed fertile lands which re-emerge every year after the floods on the river bed. The main rivers that pass through the district are Ganges, Mahananda, Kalindi, Tangon and Punarbhaba. It is surrounded by Purnea District (Bihar), Uttar Dinajpur & Dakshin Dinajpur in the north, Santhal Pargana (Bihar) and Murshidabad in the south. Rajsahi District of Bangladesh and river Ganga touches the eastern and south western side of the district respectively. There is a big riverine island or Chaur on its bed near the point where river Ganga first touches the district. This island is 24 Km. in length and is known as Bhutni Diara.

The climate is extreme in nature with a mean annual rainfall of 1500 mm. Temperature varies from 8° C (minimum) in the winter to 40° C (highest) in the summer. There are four distinct seasons, Winter (middle of November to middle of February), summer (middle of March to middle of June), Rains (Middle of June to middle of September) and the rest is the Autumn (Chakraborty, S.K. 1990).

Methodology

Records of bird observation were maintained in detail during the period of March 1998 to January 2000.

Parameters noted including habitats, feeding and evidences of breeding. Observations were taken during field trips as and when time permitted, and did not follow any pattern and periodicity. No collection or netting was done. Most of the water birds were recorded during the Mid-Winter Waterfowl Census conducted by Wetlands International (Asia Pacific). Available literatures were extensively searched for the species recorded within the district. Sportsmen and hunters were also consulted for information on ducks and other game birds. Present author's observations were compared with the earlier records. Few areas, like the northwestern part of the Bhutni Diara could not be visited due to presence of a large number of antisocial elements. However, as a general rule no single checklist is complete and that rule is applicable here also. It is believed that there are many species yet to be discovered from this district. Birds were identified with the help of Ali, and Ripley, (1987).

Bird Habitat

The original forest cover which is locally known as Kanthal and that used to exist in the district has been almost cleared except for a few fragmented areas. The vast stretches of grass lands with (*Imperata cylindrica*) as dominant species was spread over most part of the district. These grasslands were continuous upto the Nepal and Bengal Terai (Chakraborty, S.K. 1990). Various grassland species like Bengal Florican, Black Francolin

(*Francolinus francolinus*), Swamp francolin etc. were common in these grasslands. With the spread of cultivation most of these grasslands were converted to crop fields. Now they exist as small fragmented areas along the Indo-Bangladesh border and one around Bhaluka Reserve Forest, but are heavily disturbed to support any grassland species. Most of the green patches in the district are plantations (forests) of *Barringtonia* sp., *Shorea robusta*, *Dalbergia sissoo*, *Eucalyptus* sp., and these are spread over 15 areas and vary in sizes from 47 acres to 263.84 acres (Sengupta, 1969). A large portion of the district is covered by mango orchards and includes an area of 51,000 acre. These mango orchards are a good habitat for Flycatchers, Barbets and Woodpeckers.

Malda is the richest district in West Bengal as regards wetland areas. These wetlands exist in the form of Rivers, Oxbow Lakes, Beels, Marsh Lands, Ponds Etc. Beels are huge lakes and are frequently brought into existence by a river abandoning its existing bed and flowing along a new channel. Most of the wetlands get connected during the monsoon and form a vast stretches of water bodies. The largest of these are Jalkar Bithan Beel which covers an area of 100 Sq. Km. in August - September, only a few Sq. Km. during October - November and completely dries up by the end of the winter. The district is also dotted with numerous tanks numbering around 29,500 (Sengupta, 1969). The sandy

riverbeds locally known as chauras are a favorite site for waterbirds specially for ducks and waders. These chauras were frequently visited during the winter months for counting wintering waterbirds.

Results

A total of 267 species belonging to 50 families have been recorded. Out of which 138 are migratory, 128 are residents and one vagrant. Literature study reveals the presence of few species of birds in the district and this includes Grey Francolin *Francolinus pondicerianus* (Pemberton, 1854), Red Junglefowl *Gallus gallus* (Carter, 1939), Bengal Florican *Houbaropsis bengalensis* (Hume & Marshall, 1879; Baker, 1935; Carter, 1939), Lesser Florican *Sypheotides indica* (Hannessy, 1912; as quoted by Baker, 1912) and Sarus Crane *Grus antigone* (Pemberton, 1854). All these species are locally extinct in the district now and are not included in the list to avoid any confusion.

98 species of winter visitors were recorded with the highest number between December to February. The Grey Wagtail (*Molacilla alba*), Brown Shrike (*Lanius cristatus*), Common Sandpiper (*Actitis hypoleucos*) were found to be most common winter visitor and Common Pochard (*Aythya ferina*), Tufted Duck (*Aythya fuligula*), Gargeny (*Anas querquedula*) was most abundant.

The district is very rich in waterbirds. About 47% of the total

avifauna was partially or wholly water dependent. The most common resident waterbirds were Lesser Whistling-duck (*Dendrocygna javanica*) whose number some time exceeds 8000 in a flock during winter. The Fulvous Whistling-duck (*Dendrocygna bicolor*) which is regarded as rare in India (Ali, 1996) and very rare in West Bengal (Deuti et al, 1996), but a healthy population of not less than 2000 birds were sighted in different wetlands of the district.

The Farakka Barrage and 20 km. upstream area of river Ganga was found to be the single most important site for assemblages of waterbirds in West Bengal, where more than 100,000 waterfowls were sighted. (Jha & Sengupta, 1999)

During the study few birds were recorded for which records from West Bengal are very scanty, e.g. Rusty-tailed Flycatcher (*Muscicapa rauficauda*), Pallas's Gull (*Larus ichthyaetus*), Falcated Teal (*Anas falcata*), Common Sheldrake (*Tadorna tadorna*). Both field observation and literature study reveal (the presence of 18 species in the district but not listed in the Checklist of The Birds of West Bengal, prepared by Zoological Survey of India. (Majumdar et al, 1992). Most of these birds are waterbirds and grassland birds

48 species have shown definite signs of breeding in the district, and out of them most noteworthy is the Lesser Adjutant (*Leptoptilos-*

javanicus). Only Orissa is considered its breeding ground outside Assam (Subramanya, 1996). A breeding colony of this species was discovered in 1994 in the district (Jha, S., 1998) and which is the only recent record of the species breeding in West Bengal.

The following is an annotated list of some more significant species presented, along with some Globally Threatened and Near Threatened species (Collar, 1994). The list also includes species which has not been recorded in West Bengal by Majumdar et al., (1992).

Swamp Francolin (*Francolinus gularis*) VU: Carter (1939) recorded this species in the district. Present status uncertain. Few villagers near Halna Reserve Forest, recognized this species from the illustration and claimed to have seen these grassland birds about two decade ago, during the monsoon, when the near by marshy grassland submerged in flood water and the bird had taken shelter in near by relatively elevated areas and some of them were hunted down by the villagers. Not recorded by Majumdar et al., (1992).

Common Quail (*Coturnix coturnix*): Scarce winter visitor, several birds were sighted in Alampur. Not recorded by Majumdar et al., (1992).

Blue-breasted Quail (*Coturnix chinensis*): Six birds were found in a tribal hunters bag on 7th January 1993,

reported to have been captured in the district. Not recorded by Majumdar et al., (1992).

Fulvous *Whistling-duck* (*Dendrocygna bicolor*). This species is regarded as rare in India (Ali, S. 1996) and very rare in West Bengal (Deuti et al., 1996, and Mukherjee 1999) but found to be fairly common winter visitor in the district with at least 700 birds in Farakka Barrage and 500+ in Bara Sagardighi. On 3rd June, 27th June and 1st July 1999 separate pairs were sighted in different wetland areas, possibly breeds in the district.

Common Shelduck (*Tadorna tadorna*): Seven birds were sighted on Ganges in January 1993, A rare winter visitor in West Bengal. Not recorded by Majumdar et al., (1992)

Falcated Duck (*Anas falcata*): Three birds were sighted in February 1998 on Ganges near the village Gopalpur. A rare winter visitor in west Bengal. Not recorded by Majumdar et al., (1992)

Mallard (*Anas platyrhynchos*): A rare winter visitor in West Bengal, five birds were sighted in Bara Sagardighi in January 1991 and three birds in Mahan Beel in January 1994.

Baer's Pochard (*Aythya baeri*) (VU): Four birds were sighted in Bara Sagardighi on 27th January 1993, Probably regular winter visitor in small numbers but over looked among

several thousand Common Pochard on Ganges.

Indian Grey hornbill (*Ocyrceros birostris*): A rare bird in Northern and Central Bengal, possibly a regular summer visitor in mango orchards. A regular summer visitor to the compound of Arapur Jote High School (R.N. Mukherjee, teacher, A.J. high School, pers. Comm., 1995). One bird was shot by Tribal Hunters in Alampur in 1986 (Kamal marandi, high School biology teacher pers. Comm., 1993).

Lesser Coucal (*Centropus bengalensis*): Less common resident. One bird was seen feeding on a fish (*Mastacembelus armatus*) on 16th march 1997 (Jha, S., in press). Generally found along forest edges and wet grasslands. Not recorded by Majumdar et. al., (1992).

Oriental Turtle Dove (*Streptopelia orientalis*): Fairly common winter visitor. Possibly breeds in the district, one bird was seen carrying nest material on 4th April 1997. Not recorded by Majumdar et. al., (1992)

Black-tailed Godwit (*Limosa limosa*): Uncommon winter visitor, met with single or in pairs on Ganges, Not recorded by Majumdar et. al., (1992).

Pied Avocet (*Recurvirostra avosetta*): uncommon winter visitor. A flock of 104 (64 +40) birds was seen near Faralla Barrage on Ganges, on 8th January, 2000. Other record from West

Bengal is: Few individual in Nalban Bheri near Calcutta (Mukherjee, 1999). No other apparent record from central and northern West Bengal. Not recorded by Majumdar et al. (1992).

Long-billed Plover (*Charadrius dubius*) (NT): Rare winter visitor. Only two records: one bird on Ganges on 27th January, another on 2nd February 1993.

Grey-headed Lapwing (*Vanellus cinereus*) (NT): Regular winter visitor in small number. More commonly seen on Ganges. Highest recorded number is 37, near Mandal Tola, on Ganges on 2nd February 1993.

Indian Skimmer (*Rynchops albicollis*) (VU): Fairly common winter visitor. Regularly 40 to 50 winter on Ganges. Seven birds near Manikchak Ghat on 7th February 1991, four birds near Gopalpur on 27th December 1995 and nine birds on 31st January 1997, 23 birds on 1st November 1998 and 20 birds on 11th and 14th November 1999, near Farakka Barrage. Not recorded by Majumdar et. al. (1992).

Pallas's Gull (*Larus ichthyaetus*): An uncommon winter visitor in West Bengal. Several individual were sighted in Farakka Barrage on 27th January 2nd February and 15th February 1999. Possibly a regular winter visitor, but overlooked among few hundred Black-headed Gulls.

Caspian Tern (*Sterna caspia*): uncommon winter visitor in small number. Seven birds on Mahananda river on 12th November 1992, three birds on Ganges on 25th December 1996, four birds in Farakka Barrage on 17th January, 1997. Other records: Specimen ringed in the Dzhambul region of Khazakhstan (c. 43° 30' N., 70° 40' E.) on 1.7.1961 has been recorded on the Ganges river in West Bengal (c. 25° 20' N., 87° 35' E.) on 3.11.1964 (Editor, 1965). Not recorded by Majumdar et. al., (1992)

Common Tern (*Sterna hirundo*): A fairly common winter visitor in small number on Farakka Barrage. A large number seen on passage migration over the district. However, there number has decreased in recent years. In 1988-89 they were recorded between 2000-3000 each day flying north to south direction, between middle of September to middle of November. Now they are seen in small flocks of 10 to 200 birds and between 300 to 500 birds flying every day. Occasionally recorded on inland lakes and ponds during passage migration.

Black-bellied Tern (*Sterna acuticauda*) (VU): Uncommon resident, but most commonly seen during winter. Seven birds were sighted in Jalkar Bithan Beel on 21st January, 1995, four birds in Laya Bandh Beel on 26 January, 1997, 23 birds near Farakka Barrage on 23 February, 1994.

White-bellied Sea Eagle (*Haliaeetus leucogaster*): Vagrant. A storm blown bird was sighted on 3rd January 1994 in Bara Sagardighi and on 6th January 1994 near Rabindra Bhawan (Possibly the same bird). Not sighted thereafter. Definitely a bird of the sea coast, not recorded by Majumdar et al., (1992).

Pallas's Fish Eagle (*Haliaeetus leucoryphus*) (VU): A resident pair was a common sight in Bara Sagardighi upto 1995. In 1993 a nest was build by them on a Silk Cotton tree (*Bombax ceiba*) but deserted the nest due to human interference. Other Records: One bird was sighted on 21st November 1992 near Farakka Barrage and another one on 26th January 1997, near Laya Bandh Beel.

Grey-headed Fish Eagle (*Ichthyophaga ichthyaetus*) (NT): Uncommon resident. One bird in Bara Sagardighi on 29th March 1990, one bird each on 11th February 1998 and 2nd November 1999, in Adina Deer Park.

White-rumped Vulture (*Gyps bengalaensis*) (NT): A fairly common resident. Their number has decreased in recent years.

Long-billed Vulture (*Gyps indicus*) (NT): Less common resident. Occasionally seen along with the White-rumped vulture.

Red-headed Vulture (*Sarcogyps calvus*) (NT): Uncommon winter

visitor. Five birds were seen along with White-rumped Vulture over the remains of a Gour carcass- on 2nd February 1993, three birds in flight on 4th March, 1995. over Malda Town.

Pallid Harrier (*Circus macrourus*) (NT): Uncommon winter visitor, occasionally seen with Marsh Harrier near marshland and over agricultural fields.

Lesser Spotted Eagle (*Aquila pomarina*): Status uncertain. One bird was seen perched atop a *Ficus bengalensis* tree, near Firoz Minar, carcass of Gaur on 3rd March 1994. Not recorded by Majurndar et al., (1992).

Greater Spotted Eagle (*Aquila clanga*) (VU): Uncommon winter visitor. One bird was sighted near ruins of Gaur on 14th February 1993, another near Baharal on 7th December 1997. A pair regularly winters near Laya Bandh Beel.

Red-necked Falcon (*Falco chicquera*) (NT): Rare winter visitor. One bird was seen near Singabad Tilason on 26th January 1997.

Great Crested Grebe (*Podiceps cristatus*): Less common winter visitor. Four birds were sighted near Farakka Barrage on 17th January 1998 (Jha, and Sengupta, 1999), one bird in Vikon beel on 25th December 1999, a pair in Bara Sagar Dighi on 10th January 2000.

Darter (*Anhinga melanogaster*) (*ssp. melanogaster* NT): Less common resident, but fairly common during winter. On 15th January 15 birds were sighted in Bara Sagardighi (Jha and Sengupta, 1999) which is possibly the largest assemblage in West Bengal in recent years.

Glossy Ibis (*Plegadis falcinellus*): "A juvenile ringed in the Volga Delta, USSR, C. 45° 55' N., 47° 45' E. (12.7.1941) was recovered in Malda district, West Bengal C. 25° N., 88° 30'E. (c. 15.4.1942)" Ali and Ripley, 1987), No subsequent record. Not recorded by Majumdar et al., (1992).

Black-headed Ibis (*Threskiornis melanocephalus*) (NT): Rare local migrant. Two records: three birds near Gopalpur on Ganges (12th January 1991) and seven birds near Mandal Tola, on Ganges chaur (25th December, 1993).

Asian Openbill (*Anastomus oscitans*) (NT): Common resident. One big breeding colony of about 5000 birds exist in Adina Deer Park. However, small colony of 20 to 50 birds has been noted else where in the district.

Lesser Adjutant (*Leptoptilos javanicus*) (VU): Less common resident, but fairly common during winter, when possibly resident population is augmented by local migrants. A small breeding colony was discovered in Kahala village about 48 Km. from the district town, in 1994 (Jha, S., 1998), which is possibly the

only recent record of the species breeding in West Bengal. However, the tree in which the colony existed was denuded in November 1998. Subsequent attempt by the birds to nest in nearby Mango trees was abandoned.

Greater Adjutant (*Leptoptilos dubius*) (EN): Rare winter visitor. One bird was sighted in an agricultural field near Alampur on 11th February, 1990 and another bird near Baharal on 27th January 1995.

Hodgson's Bushchat (*Saxicola insignis*) (VU): Rare winter visitor, seen only once on 1st February 1997, near Singabad Tilason, along with several common Stonechat, in the vast stretches of *Saccharum* Spp. Not recorded by Majumdar et al., (1992).

Pied Bushchat (*Saxicola caprata*): Regular winter visitor in small number. Not recorded by Majumdar et al., (1992).

Grasshopper Warbler (*Locustella naevia*)-. Scarce winter visitor. Occasionally seen in grasslands and reedbeds near wetlands along with Zitting Cisticola. Not recorded by Majumdar et al., (1992).

Lesser Whitethroat (*Sylvia curruca*)'. Rare winter visitor, seen on 12th January 1989 near Malda Aerodrum. Not recorded by Majumdar et al., (1992).

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Abstract

Malda District (25° 33' 08" N 88° 20' 10" E.,) in the Indian state of West Bengal is ornithologically poorly known area. A total of 267 species were recorded in a span of 12 years, which includes 10 globally threatened species, viz. Swamp Francolin *Francolinus gularis*, Ferruginous Pochard *Aythya nyroca*. Baer's Pochard *Aythya baeri*, Black-bellied Tern *Sterna acuticauda*, Indian Skimmer *Rynchops albicollis*, Pallas's Fish Eagle *Haliaeetus leucoryphus*, Greater Spot- ted Eagle *Aquila clanga*, Greater Adjutant *Leptoptilos dubius*, Lesser Adjutant *L. javanicus*, Hodgson's Bushchat *Saxicola insignis* and 12 near-threatened Species.

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APPENDIX**Bird Species recorded in Malda District**

Name & Scientific Name	Habitat	Abundance	Status
Black Francolin (<i>Francolinus francolinus</i>)	G, AL	r	R
Swamp Francolin (<i>Francolinus gularis</i>) (VU)	G	?	UN
Common Quail (<i>Conturnix coturnix</i>)	G, AL	r	WV
Rain Quail (<i>Coturnix coromandelica</i>)	G, AL	S	R
Blue-breasted Quail (<i>Coturnix chinensis</i>)	G	S	R
Fulvous Whistling-duck (<i>Dendrocygna bicolor</i>)	W	FC	WV/R?
Lesser Whistling-duck (<i>Dendrocygna javancia</i>)	W	C	RB
Grey lag Goose (<i>Anser anser</i>)	W	FC	WV
Bar-headed Goose (<i>Anser indicus</i>)	W	U	WV
Ruddy Shelduck (<i>Tadorna ferruginea</i>)	W	FC	WV
Common Shelduck (<i>Tadorna tadorna</i>)	W	U	WV
Comb Duck (<i>Sarkidiornis melanotos</i>)	W	r	WV
Cotton Pygmy-goose (<i>Nettapus coromandelianus</i>)	W	C	WV
Gadwall (<i>Anas strepera</i>)	W	C	WV
Falcated Duck (<i>Anas falcata</i>)	W	r	WV
Eurasian Wigeon (<i>Anas Penelope</i>)	W	FC	WV
Mallard (<i>Anas platyrhynchos</i>)	W	r	WV
Spot-billed Duck (<i>Anas poecilorhyncha</i>)	W	FC	WV
Northern Shoveler (<i>Anas clypeata</i>)	W	C	WV
Northern Pintail (<i>Anas acuta</i>)	W	C	WV
Garganey (<i>Anas querquedula</i>)	W	C	WV
Common Teal (<i>Ans crecca</i>)	W	C	WV
Red-crested Pochard (<i>Rhodonessa rufina</i>)	W	C	WV
Common Pochard (<i>Aythya ferina</i>)	W	C	WV
Ferruginous Pochard (<i>Aythya nyroca</i>) (VU)	W	FC	WV
Baer's Pochard (<i>Aythya baeri</i>) (VU)	W	U	WV
Tufted Duck (<i>Aythya fuligula</i>)	W	C	WV
Yellow-legged Buttonquail (<i>Turnix tanki</i>)	G	U	R
Barred Buttonquail (<i>Turnix suscitator</i>)	G	U	R
Eurasian Wryneck (<i>Jynx torquilla</i>)	MG, PL	U	WV
Fulvous-breasted Woodpecker (<i>Dendrocopos macei</i>)	MG	U	R
Yellow-crowned Woodpecker (<i>Dendrocopos mahrattensis</i>)	MG, PL	FC	RB
Streak-throated Woodpecker (<i>Picus xanthopygaeus</i>)	MG, PL	FC	R
Black-rumped Flameback (<i>Dinopium benghalense</i>)	MG, PL	C	RB
Lineated Barbet (<i>Megalaima lineata</i>)	MG	r	R?
Blue throated Barbet (<i>Megalaima asiatica</i>)	MG, PL	C	RB
Coppersmith Barbet (<i>Megalaima haemacephala</i>)	MG, PL	C	RB
Indian Grey Hornbill (<i>Ocyrceros birostris</i>)	MG	U	LM
Common Hoopoe (<i>Upupa epops</i>)	AL	C	LM
Indian Roller (<i>Coracias benghalensis</i>)	Al, PL	C	R
Common Kingfisher (<i>Alcedo atthis</i>)	W	C	RB

Name & Scientific Name	Habitat	Abundance	Status
Stork-billed kingfisher (<i>Halcyon capensis</i>)	W	C	RB
White-throated kingfisher (<i>Halcyon smyrensis</i>)	W, AL	C	RB
Pied Kingfisher (<i>Ceryle rudis</i>)	W	C	R
Green Bee-eater (<i>Merops orientalis</i>)	AL, PL	C	RB
Blue-tailed Bee-eater (<i>Merops philippinus</i>)	AL	C	RB
Chestnut-headed Bee-eater (<i>Merops leschenaulti</i>)	AL	U	LM
Pied Cuckoo (<i>Clamator jacobinus</i>)	MG	C	RV
Common Hawk Cuckoo (<i>Hierococyx varius</i>)	MG, PL	C	R
Indian Cuckoo (<i>Coccyzoides myzomela</i>)	MG	U	LM
Grey-bellied Cuckoo (<i>Coccyzoides passerinus</i>)	MG	r	R
Asian Koel (<i>Eudynamis scolopacea</i>)	MG, PL	C	RB
Greater Coucal (<i>Centropus sinensis</i>)	MG, PL	C	R
Lesser Coucal (<i>Centropus bengalensis</i>)	PL	U	R
Rose-ringed Parakeet (<i>Psittacula krameri</i>)	MG, PL	C	RB
Plum-headed Parakeet (<i>Psittacula cyanocephala</i>)	MG	C	RB
Asian Palm Swift (<i>Cypsinurus balasienis</i>)	A	C	R
House Swift (<i>Apus affinis</i>)	A, OM	C	RB
Barn Owl (<i>Tyto alba</i>)	OM	r	R
Brown Fish Owl (<i>Ketupa zeylonensis</i>)	PL	U	R
Jungle Owlet (<i>Glaucidium radiatum</i>)	PL	FC	R
Spotted Owlet (<i>Athene brama</i>)	MG, PL	C	R
Brown Hawk Owl (<i>Ninox scutulata</i>)	PL	R	R
Short-eared Owl (<i>Asio flammeus</i>)	PL	U	WV
Grey Nightjar (<i>Caprimulgus indicus</i>)	MG, PL	FC	R
Indian Nightjar (<i>Caprimulgus asiaticus</i>)	MG, PL	C	R
Savanna Nightjar (<i>Caprimulgus affinis</i>)	MG, PL	FC	R
Rock Pigeon (<i>Columba livia</i>)	OM	C	R
Oriental Turtle Dove (<i>Streptopelia orientalis</i>)	AL	FC	LM
Spotted Dove (<i>Streptopelia chinensis</i>)	AL, B	C	RB
Red collared Dove (<i>Streptopelia tranquebarica</i>)	AL	C	LM
Eurasian Collared Dove (<i>Streptopelia decaocto</i>)	AL	C	R
Yellow-footed Green Pigeon (<i>Treron phoenicoptera</i>)	MG, PL	C	R
Green Imperial Pigeon (<i>Ducula aenea</i>)	PL	r	LM
Water Rail (<i>Rallus aquaticus</i>)	W	U	LM
White-breasted Waterhen (<i>Amaurornis phoenicurus</i>)	W	C	RB
Baillon's Crake (<i>Porzana pusilla</i>)	W	S	R
Water Cock (<i>Gallicrex cinerea</i>)	W	U	R
Purple Swamphen (<i>Porphyrio porphyrio</i>)	W	C	LM
Common moorhen (<i>Gallinula chloropus</i>)	W	C	LM
Common Coot (<i>Fulica atra</i>)	W	C	WV
Pintail Snipe (<i>Gallinago stenura</i>)	W	C	WV
Common Snipe (<i>Gallinago gallinago</i>)	W	FC	WV
Jack Snipe (<i>Lymnocyrtus minimus</i>)	W	U	WV
Black-tailed Godwit (<i>Limosa limosa</i>)	W	FC	WV
Whimbrel (<i>Numenius phaeopus</i>)	W	FC	WV

Name & Scientific Name	Habitat	Abundance	Status
Eurasian Curlew (<i>Numenius arquata</i>)	W	C	WV
Spotted Redshank (<i>Tringa erythropus</i>)	W	U	WV
Common Redshank (<i>Tringa totanus</i>)	W	FC	WV
Marsh Sandpiper (<i>Tringa stagnatilis</i>)	W	FC	WV
Common Greenshank (<i>Tringa nebularia</i>)	W	C	WV
Green Sandpiper (<i>Tringa ochropus</i>)	W	C	WV
Wood Sandpiper (<i>Tringa glareola</i>)	W	C	WV
Terek Sandpiper (<i>Xenus cinereus</i>)	W	U	WV
Common Sandpiper (<i>Actitis hypoleucos</i>)	W	C	WV
Little stint (<i>Calidris minuta</i>)	W	C	WV
Temminck's Stint (<i>Calidris temminckii</i>)	W	C	WV
Ruff (<i>Philomachus pugnax</i>)	W	r	WV
Greater Painted-snipe (<i>Rostratula benghalensis</i>)	W	U	WV
Pheasant-tailed Jacana (<i>Hydrophasianus chirurgus</i>)	W	C	LM
Bronze-winged Jacana (<i>Metopidius indicus</i>)	W	C	RB
Eurasian Thick-knee (<i>Burhinus oedicnemus</i>)	AL	U	R
Black-winged Stilt (<i>Himantopus himantopus</i>)	W	C	WV
Pied Avocet (<i>Recurvirostra avosetta</i>)	W	FC	WV
Pacific Golden Plover (<i>Pluvialis fulva</i>)	W	C	WV
Grey Plover (<i>Pluvialis squatarola</i>)	W	r	WV
Long-billed Plover (<i>Charadrius pacidus</i>) (NT)	W	r	WV
Little Ringed plover (<i>Charadrius duvius</i>)	W	C	WV
Kentish Plover (<i>Charadrius alexandrinus</i>)	W	U	WV
River Lapwing (<i>Vanellus duvaucelii</i>)	W	FC	LM
Grey-headed Lapwing (<i>Vanellus cinereus</i>) (NT)	W	FC	WV
Red-wattled Lapwing (<i>Vanellus indicus</i>)	W, AL	C	R
Oriental Pratincole (<i>Glareola maldivarum</i>)	W	U	R
Small Pratincole (<i>Glareola lactea</i>)	W	FC	R
Indian Skimmer (<i>Rynchops albigollis</i>) (VU)	W	FC	LM
Pallas's Gull (<i>Larus ichthyaetus</i>)	W	U	WV
Brown-headed Gull (<i>Larus brunnicephalus</i>)	W	C	WV
Black-headed Gull (<i>Larus ridibundus</i>)	W	C	WV
Gull-billed Tern (<i>Gelochelidon nilotica</i>)	W	U	LM
Caspian Tern (<i>Sterna caspia</i>)	W	U	WV
River Tern (<i>Sterna aurantia</i>)	W	C	R
Common Tern (<i>Sterna hirundo</i>)	W	C	WV, PM
Black-bellied Tern (<i>Sterna acuticauda</i>) (VU)	W	U	R
Whiskered Tern (<i>Chilidonias hybridus</i>)	W	C	LM
Osprey (<i>Pandion haliaetus</i>)	W	C	WV
Oriental honey-buzzard (<i>Pernis ptilorhynchus</i>)	PL	FC	R
Black-shouldered Kite (<i>Elanus caeruleus</i>)	AL	U	R
Black Kite (<i>Milvus migrans</i>)	A	C	RB
Brahminy Kite (<i>Haliastur Indus</i>)	W	FC	R
White-bellied Sea Eagle (<i>Ichthyophaga ichthyaetus</i>) (NT)	W	r	V
Palas's Fish Eagle (<i>Haliaeetus leucoryphus</i>) (VU)	W	U	R

Name & Scientific Name	Habitat	Abundance	Status
Grey-headed Fish Eagle (<i>Ichthyophaga ichthyaetus</i>) (NT)	W	U	R
White-rumped Vulture (<i>Gyps bengalensis</i>) (NT)	A	C	RB
Long-billed Vulture (<i>Gyps indicus</i>) (NT)	A	FC	R
Red headed Vulture (<i>Sarcogyps calbus</i>) (NT)	A	S	LM
Crested Serpent Eagle (<i>Spilornis cheela</i>)	PL	U	R
Eurasian Marsh Harrier (<i>Circus aeruginosus</i>)	W	C	WV
Pallid Harrier (<i>Circus macrourus</i>) (NT)	W	FC	WV
Pied Harrier (<i>Circus melanoleucos</i>) (NT)	G, AL	FC	WV
Shikra (<i>Accipiter badius</i>)	MG, PL	C	R
White-eyed Buzzard (<i>Butastur teesa</i>)	PL	r	R
Lesser Spotted Eagle (<i>Aquila pomarina</i>)	PL, W	U	LM
Greater Spotted Eagle (<i>Aquila clanga</i> (VII))	W	U	WV
Steppe Eagle (<i>Aquila nipalensis</i>)	W, PL	U	WV
Booted Eagle (<i>Hieraaetus pennatus</i>)	PL	r	R
Common Kestrel (<i>Falco tinnunculus</i>)	AL, PL	C	WV
Red-necked Falcon (<i>Falco chicquera</i>) (NT)	AL, PL	U	R
Eurasian Hobby (<i>Falco subbuteo</i>)	AL, PL	FC	LM
Little Grebe (<i>Tachybaptus ruficollis</i>)	W	C	LM
Great Crested Grebe (<i>Podiceps cristatus</i>)	W	FC	WV
Darter (<i>Anhinga melanogaster</i>) (ssp. <i>melanogaster</i> NT)	W	U	R, LM
Little Cormorant (<i>Phalacrocorax niger</i>)	W	C	RB
Indian Cormorant (<i>Phalacrocorax fuscicollis</i>)	W	C	RB
Great Cormorant (<i>Phalacrocorax carbo</i>)	W	C	LM
Little Egret (<i>Egretta garzetta</i>)	W	C	R
Grey heron (<i>Ardea cinerea</i>)	W	C	R
Purple Heron (<i>Ardea purpurea</i>)	W	FC	R
Great Egret (<i>Casmerodius albus</i>)	W	C	R
Intermediate Egret (<i>Mesophoyx intermedia</i>)	W	C	R
Cattle Egret (<i>Bubulcus ibis</i>)	W	C	RB
Indian Pond Heron (<i>Ardeola grayii</i>)	W	C	RB
Little Heron (<i>Butorides striatus</i>)	W	U	R
Black-crowned Night Heron (<i>Nycticorax nycticorax</i>)	W	C	RB
Yellow Bittern (<i>Ixobrychus sinensis</i>)	W	U	LM
Cinnamon Bittern (<i>Ixobrychus cinnamomeus</i>)	W	C	RV
Black Bittern (<i>Dupetor flavicollis</i>)	W	U	R
Glossy Ibis (<i>Plegadis falcinellus</i>)	W	r	WV
Black-headed Ibis (<i>Threskiornis melanocephalus</i>) (NT)	W	r	LM
Black Ibis (<i>Pseudibis papillosa</i>) (NT)	W	U	R
Eurasian Spoonbill (<i>Platalea leucorodia</i>)	W	r	LM
Asian Openbill (<i>Anastomus oscitans</i>) (NT)	W	C	RB
Woolly-necked Stork (<i>Ciconia episcopus</i>)	W	FC	R
Lesser Adjutant (<i>Leptoptilos javanicus</i>) (VU)	W	FC	RB
Greater Adjutant (<i>Leptoptilos dubius</i>) (EN)	W	r	LM
Brown Shrike (<i>Lanius cristatus</i>)	MG, PL	C	WV
Long-tailed Shrike (<i>Lanius schach</i>)	PL, AL	C	WV

Name & Scientific Name	Habitat	Abundance	Status
Grey-backed Shrike (<i>Lanius tephronotus</i>)	PL, AL	FC	LM
Rufous Treepie (<i>Dendrocitta vagabunda</i>)	MG, PL	C	R
House Crow (<i>Corvus splendens</i>)	MG, B	C	RB
Large-billed crow (<i>Corvus macrorhynchos</i>)	MG, B	FC	R
Ashy Woodswallow (<i>Artamus fuscus</i>)	A, PL	C	R
Eurasian Golden Oriole (<i>Oriolus oriolus</i>)	MG, PL	C	R
Black-hooded Oriole (<i>Oriolus xanthornus</i>)	MG, PL	C	R
Large Cuckooshrike (<i>Coracina macei</i>)	PL	C	R
Black-headed Cuckooshrike (<i>Coracina melanoptera</i>)	MG, PL	C	R
Small Minivet (<i>Pericrocotus cinnamomeus</i>)	MG	C	R
White throated Fantail (<i>Rhipidura albicollis</i>)	PL, G	C	RB
White-browed fantail (<i>Rhipidura aureola</i>)	LP, B	C	R
Black Drongo (<i>Dicrurus macrocercus</i>)	PL, MG	C	RB
Ashy Drongo (<i>Dicrurus leucophaeus</i>)	PL	C	WV
Bronzed Drongo (<i>Dicrurus aeneus</i>)	PL	U	LM
Black-naped Monarch (<i>Hypothymis azurea</i>)	MG, PL	C	WV
Asian Paradise-flycatcher (<i>Terpsiphone paradisi</i>)	MG, PL	C	RV
Common Iora (<i>Aegithina tiphia</i>)	MG	C	RB
Common Woodshrike (<i>Tephrodornis pondicerianus</i>)	MG, PL	C	LM
Blue Rock Thrush (<i>Monticola solitarius</i>)	B	FC	PM
Orange-headed Thrush (<i>Zoothera citrina</i>)	MG	U	R
Asian Brown Flycatcher (<i>Muscicapa dauurica</i>)	MG, PL	C	WV
Rusty-tailed Flycatcher (<i>Muscicapa ruficauda</i>)	PL, B	U	WV, PM
Red-throated Flycatcher (<i>Ficedula parva</i>)	PL, MG	C	WV
Verditer Flycatcher (<i>Eumyias thalassina</i>)	PL	r	LM
Tickell's Blue Flycatcher (<i>Cyornis tickelliae</i>)	PL	U	LM
Grey-headed Canary Flycatcher (<i>Culicicapa ceylonensis</i>)	PL, MG	C	WV
Siberian Rubythroat (<i>Luscinia calliope</i>)	W	U	WV
Bluethroat (<i>Luscinia svecica</i>)	W	C	WV
Oriental Magpie Robin (<i>Copsychus saularis</i>)	B	C	RB
Black Redstart (<i>Phoenicurus ochruros</i>)	W	FC	LM
Hodgson's Bushchat (<i>Saxicola insignis</i>) (VU)	G	r	WV
Common Stonechat (<i>Saxicola torquata</i>)	G	C	WV
Pied Bushchat (<i>Saxicola caprata</i>)	G, PL	U	LM
Chestnut-tailed Starling (<i>Sturnus malabaricus</i>)	PL, B	C	RB
Brahminy Starling (<i>Sturnus pagodarum</i>)	MG, B	U	R
Asian Pied Starling (<i>Sturnus contra</i>)	AL, B, W	C	RB
Common Myna (<i>Acridotheres tristis</i>)	B	C	RB
Bank Myna (<i>Acridotheres ginginianus</i>)	B, AL	C	RB
Jungle Myna (<i>Acridotheres fuscus</i>)	B, AL	C	RB
Great Tit (<i>Parus major</i>)	MG, PL	U	R
Sand martin (<i>Riparia riparia</i>)	W	U	LM
Plain martin (<i>Riparia paludicola</i>)	W	C	RB
Barn Swallow (<i>Hirundo rustica</i>)	W	C	WV
Red-rumped Swallow (<i>Hirundo daurica</i>)	W	r	WV

Name & Scientific Name	Habitat	Abundance	Status
Red-whiskered Bulbul (<i>Pycnonotus jocosus</i>)	PL, B	C	RB
Red-vented Bulbul (<i>Pycnonotus cafer</i>)	PL, B	C	RB
Zitting Cisticola (<i>Cisticola juncidis</i>)	G	C	R
Bright headed Cisticola (<i>Cisticola exilis</i>)	G	U	LM
Ashy Prinia (<i>Prinia socialis</i>)	G	FC	R
Plain Prinia (<i>Prinia inornata</i>)	G	C	R
Oriental White-eye (<i>Zosterops palpebrosus</i>)	MG, PL	C	R
Grasshopper Warbler (<i>Locustella naevia</i>)	G	FC	WV
Paddyfield Warbler (<i>Acrocephalus agricola</i>)	G	C	WV
Blyth's reed Warbler (<i>Acrocephalus dumetorum</i>)	W	FC	WV
Clamorous reed Warbler (<i>Acrocephalus stentoreus</i>)	W	C	WV
Booted Warbler (<i>Hippolais caligata</i>)	G	FC	WV
Common Tailorbird (<i>Orthotomus sutorius</i>)	PL, B	C	RB
Common Chiff Chiff (<i>Phylloscopus collybita</i>)	PL	C	WV
Dusky Warbler (<i>Phylloscopus fuscatus</i>)	PL	U	WV
Tickell's Leaf Warbler (<i>Phylloscopus affinis</i>)	PL	U	WV
Hume's Warbler (<i>Phylloscopus humei</i>)	PL	FC	WV
Greenish Warbler (<i>Phylloscopus trochiloides</i>)	PL	FC	WV
Large-billed Leaf Warbler (<i>Phylloscopus magnirostris</i>)	PL, AL	W	WV
Striated grassbird (<i>Megalurus palustris</i>)	G	U	R
Jungle Babbler (<i>Turdoides striatus</i>)	B, MG	C	RB
Lesser Whitethroat (<i>Sylvia curruca</i>)	AL	r	WV
Rufous-winged Bushlark (<i>Mirafra assamica</i>)	AL, G	C	RB
Ashy-crowned Sparrow Lark (<i>Eremopterix grisea</i>)	AL, G	C	RB
Sand Lark (<i>Calandrella raytal</i>)	AL	FC	R?
Oriental Sky Lark (<i>Alauda gulgula</i>)	AL, G	FC	LM
Thick-billed Flowerpecker (<i>Dicaeum agile</i>)	PL	r	R
Pale-billed Flowerpecker (<i>Dicaeum erythrorhynchos</i>)	MG, PL	C	R
Purple-rumped Sunbird (<i>Nectarinia ceylonica</i>)	MG, PL	U	R
Purple Sunbird (<i>Nectarinia asiatica</i>)	PL, B	C	RB
House Sparrow (<i>Passer domesticus</i>)	B	C	RB
White Wagtail (<i>Motacilla alba</i>)	W	C	WV
White-browed Wagtail (<i>Motacilla maderaspatensis</i>)	W	C	R
Citrine wagtail (<i>Motacilla citreola</i>)	W	FC	WV
Yellow Wagtail (<i>Motacilla flava</i>)	W	C	WV
Grey Wagtail (<i>Motacilla cinerea</i>)	W	C	WV
Richard's Pipit (<i>Anthus richardi</i>)	AL	U	WV
Tawny Pipit (<i>Anthus campestris</i>)	AL, PL	R	LM
Paddyfield Pipit (<i>Anthus rufulus</i>)	AL	C	RB

Shooting Down the Wild Life Protection Act

By

Dilip M. Naik, I.F.S.,
Retired Chief Conservator of Forest W.L. Gujarat

Hunting had been a great sport in the past for the rich and powerful of this country. The fading photographs of the maharajas, with their foot planted on the carcass of some poor animal still adorn the walls of the numerous palaces scattered all around the country.



The stuffed torsos of tigers, deer, bears and many such unfortunate animals have lived through the history to tell us the story of the wanton and mindless slaughter of the helpless species; the living exhibits of the bravado of our past rulers.

In a country with such a history of mindless destruction of the wild life, the enactment of the WILD LIFE PROTECTION ACT, 1972 was indeed a break from the past.



The solemn intention behind the enactment of the Wild Life Protection Act (WP Act in short) was to protect the endangered flora and fauna from the hands of the human beings. A law of profound necessity in our country, a country which had the bounty of nature but very little sensitivity towards it.

The Lawmakers however, did take great care while enacting the WP Act. Under the Chapter III of the Act, hunting of any wild animal mentioned in the schedule— I & IV was totally prohibited. Any infraction of this statutory injunction attracted stiff penal consequences.

Perhaps the most significant aspect of the WP Act was that provisions regarding the declarations of sanctuaries and national Parks of areas which were ecologically sensitive under section 26 A and 35 of Act, respectively.

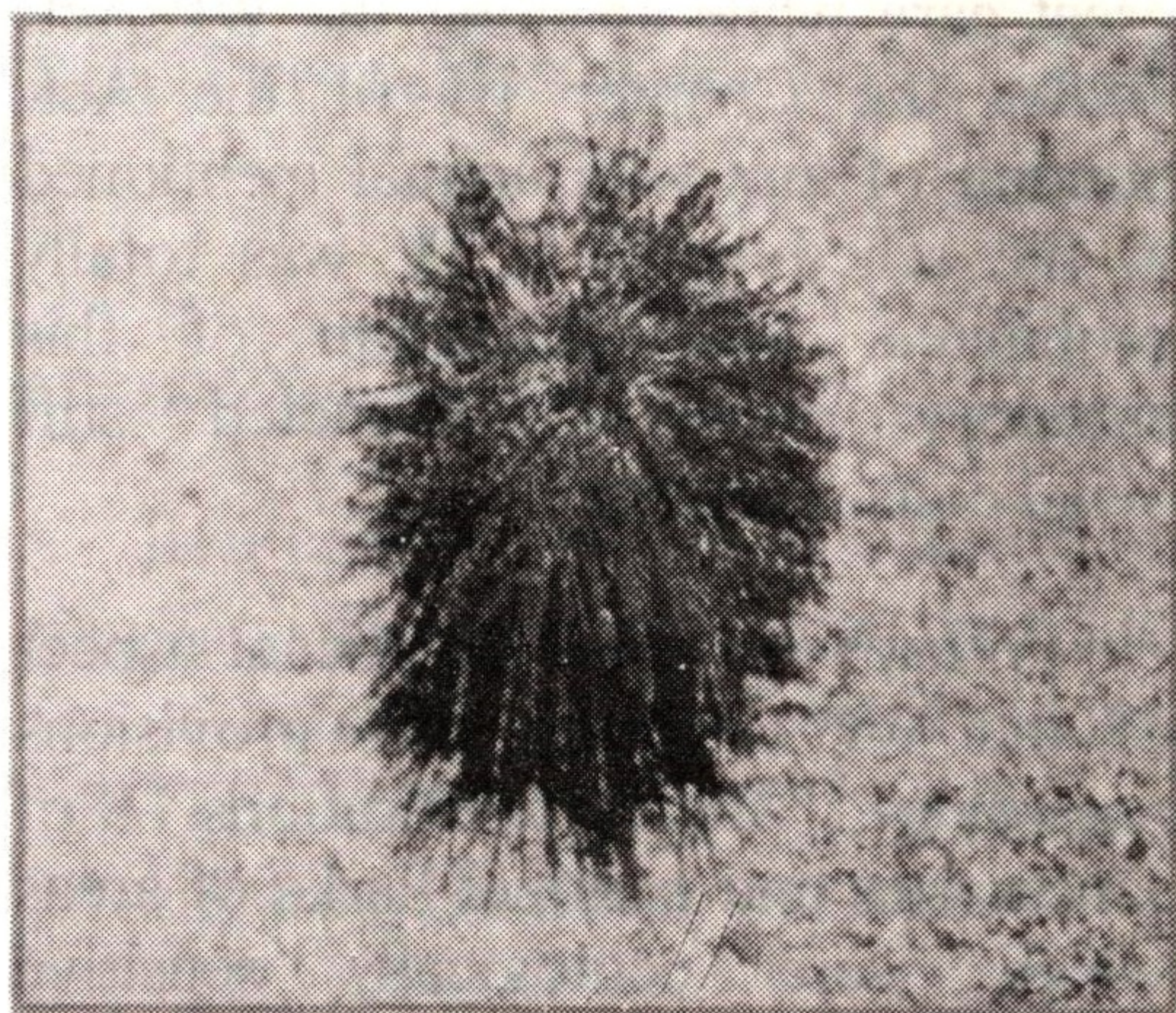
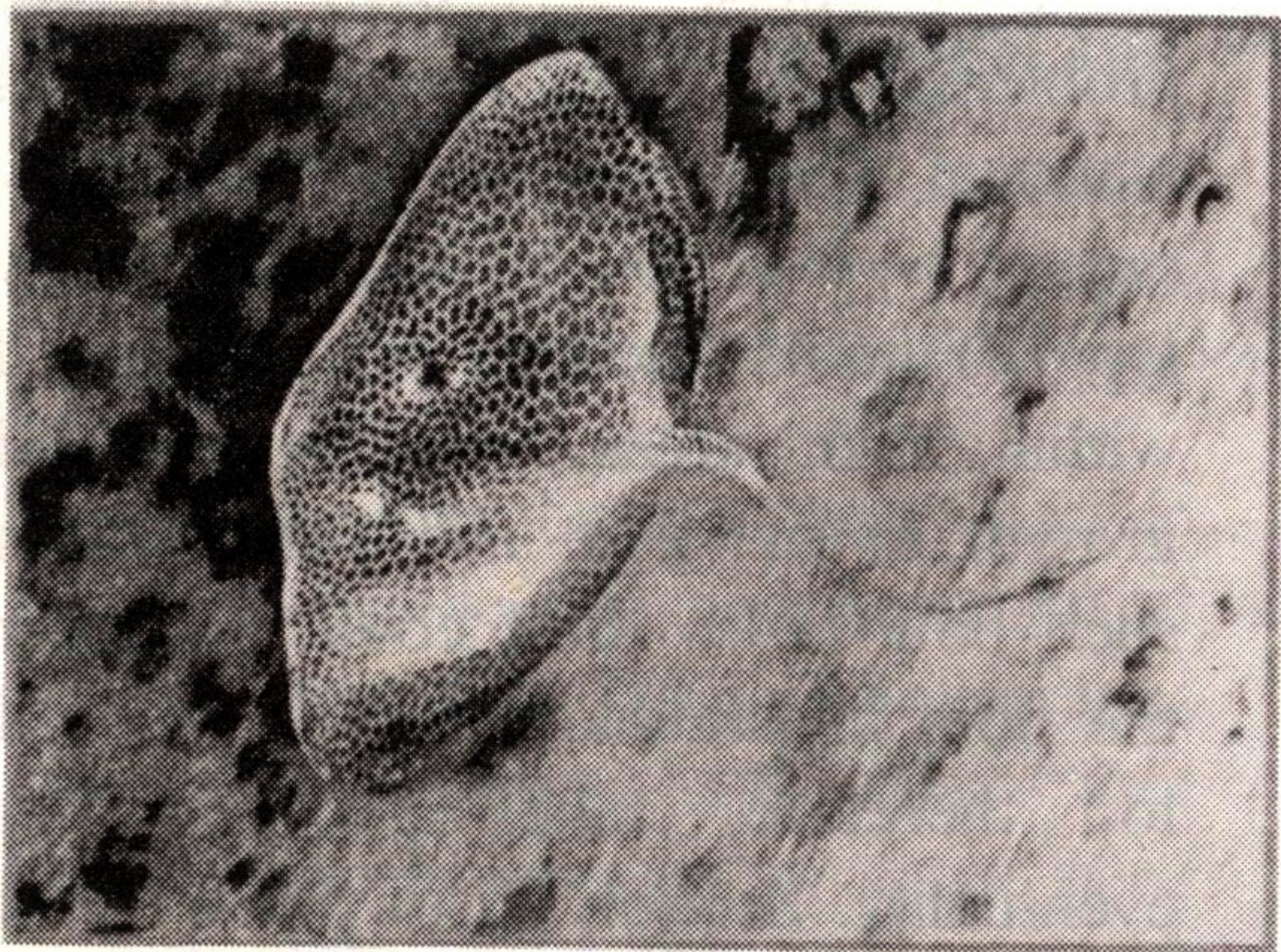
Realizing the danger to the endangered flora and fauna emanating primarily from the humans themselves, the Lawmakers made the areas declared as Sanctuary and National Parks totally out of bounds for any form of human activities except those specifically provided in the WP Act. Such areas were, therefore, made closed domains for the human activities.

What was permitted was research work and photography or similar activities and even the entry of any person within the sanctuary was made subject to official permission under section 27 of the Act.

The deep concern of the Lawmakers is reflected in the safeguards built in every section of the WP Act against its misuse or misinterpretation. The areas declared as Sanctuaries or National Parks are

closed domains. Closed domains however pose its own inherent problems. As the sanctuaries and National Parks are made completely out of bounds for humans and every type of human activity are prohibited within such areas, the uncontrolled growth of the flora and fauna within such boundaries itself could endanger the flora and fauna. The WP Act had to, therefore, take care of this eventuality. Section 29 of the WP Act was, therefore, specifically engrafted in the enactment conferring limited power on the Chief Wildlife warden to permit the destruction or removal of the wildlife or its habitat within the protected area, but for the only reason that such destruction should be for the benefit of the wildlife itself. Even this power conferred on the Chief Wildlife Warden has been made expressly subject to the prior sanctions of the Government upon its independent satisfaction that such removal or destruction would be necessary for the better management of wildlife within the protected area.

But alas! Who ever knew that the provision of Section 29 would be used by the authorities themselves to shoot down the WP Act itself. The story of this new “hunting spree” started with the Reliance Industries Ltd. (RIL) deciding to build their massive Crude Petroleum Refinery Plant at Mitikhavdi, near Jamnagar, Gujarat.



In the year 1993, the Reliance Industries Ltd. had issued the prospectus for installing the biggest grass-root refinery near Jamnagar and this spot was chosen to utilize the calm waters of the Gulf of Kutch for the purpose of berthing of the huge crude oil tankers. To unload the crude from the oil tankers and to store the crude in the tanks on the shore, the company had proposed to lay pipelines through the sanctuary as well as national park areas situated along the coast. These protected areas are situated all along the coastal belt from Okha to Navlaki and forms the southern boundary of the Gulf of Kutch. This area stores the richest Marine life of the Country.

The management plan of M.N.P. and sanctuary approved by Govt. of Gujarat is as under:-

“1.5 uniqueness Associated with Gulf of Kachchh

Gulf of Kachchh with its shallow inter-tidal and chain of islands has one of the richest marine habitats in this subcontinent. The entire southern coast of the Gulf in Jamnagar district is ringed by a cluster of 42 islands, and many of them are fringed by coral reefs and bear mangrove vegetation. Past record reveals that this Gulf area has unique physical variations in the subtropical and arid climate.

Erstwhile State ruler of Baroda State invited Mr. James Hornell of Sri Lanka who surveyed and recorded the marine fauna of Gulf of Kachchh as early as 1905. Mr. Hornell, while surveying the Okhamandal coast, revealed, “he had never seen before such a rich marine biota in so confined a place.

Studies conducted in the Gulf of Kachchh by WWF, India and

Saurashtra University (1984-89), Indian institute of Oceanography, Goa, and other research scholars in the past have recorded over 120 species of algae, 70 species of sponges, 37 species of hard and soft corals under 24 genera, many species of sea anemones and jelly fishes, about 200 species of fishes including 8 species of shark, 27 species of prawns, about 30 species of Phylum molluscs, over 12 species of Phylum echinodermata, 5 species of Phylum annelida, many species of reptiles including three species of endangered sea turtle, three species of sea mammal, over 200 species of birds including 94 species of water birds (resident, local migrant, migrant) and many plant species of tidal forests with *Avicennia*, *Rhizophora* and *Cerops* as major species. Mangroves and scrub forests in coasts and on islands support rich flora and fauna in this region.

The pipeline to carry the crude oil from the tanker was to pass through these protected areas. So, the berthing of the huge oil tankers and the construction of the massive refinery on the shore and the pipelines running through the protected areas would therefore, necessarily endanger the flora and fauna within the protected areas, specially with the existing risk of oil leakages. Realizing the grave dangers posed by the industrial activities so close to the protected areas, especially the laying of the pipelines right through the areas, Jansangarsh March had filed a Public Interest

Litigation in the year 1993 in the High Court of Gujarat. The said case, however, was rejected on the ground that the matter was premature and that the authorities would take proper care of the environmental laws.

In the Month of August, 1997 however, the Chief Wildlife Warden exercising powers under section 29 of the Act, granted permission to the Reliance Petroleum Ltd. to lay their crude pipelines through the Sanctuary as well as National Park! The Jansangarsh March had once again approached the High Court by way of Public Interest Litigation challenging the powers of the Wildlife Warden to grant such permission.

In the second round of litigation before the High Court of Gujarat, the High Court of Gujarat did hold that the sanction to be a prior sanction and not after the Chief Wildlife Warden takes a decision and therefore, the sanction granted was illegal. The High Court however, did not prohibit the Reliance Petroleum from carrying out the installation of the pipeline on the ground that the company had invested a very large sum of money.

Emboldened by the fact that the permission granted to the Reliance Petroleum was not quashed, the Chief Wildlife Warden gave further permission to the Bharat Oman Refinery Ltd (BROL) to lay yet another pipeline in the same area once

again through the Sanctuary and the National Park.

Jansangarsh Manch had once again challenged the permission and the Division Bench of the High Court this time clearly held that the Chief Wildlife Warden had absolutely no power under Section 29 of the Wild Life Protection Act to grant permission for laying of crude pipeline or any other industrial activity. Other oil companies and multi nationals, who had earlier proposed to construct their refineries, ports etc, were directly affected by this judgment, as the authorities could no longer help them out. Several appeals were filed before the Supreme Court challenging judgment of the High Court by such Companies like, ESSAR OIL Ltd., Government of Gujrat, BORL, Poshitra Port Ltd, etc. The Supreme Court has stayed the operation of the judgment and order of the High Court and by way of interim order, permitted the Government of Gujrat to grant further permissions, subject to the outcome of the appeals before the Apex Court. The appeals are presently pending before the Apex Court.

The result of the above litigations would clearly show that the authorities like Government, Chief Wildlife Warden, who are entrusted with the job of protecting the Flora and Fauna are themselves bent upon violating the WP Act and now all hopes are pinned on the Apex Court to come to the aid of the Wildlife. As outlined above, under no stretch of imagination, can it be said that industrial activities and much less, laying of pipelines to carry crude oils could have ever been envisaged to the permissible within a close domain like sanctuary. In fact, such a preposition itself is shocking. Yet the authorities, by misreading the provisions of Section 29 are bending backwards to satisfy the major industrial houses without the slightest concern for the grave damage that such decisions would cause.

Thus, while the Maharajas of the past shot down the wildlife, our democratically elected Government and its officials are now shooting down Wildlife Protection Act itself!

Status Survey and Ecology of Nilgai, *Boselaphus tragocamelus* around Jodhpur, Rajasthan

By

A.K. Chhangani, A.k. Purohit and S.M. Mohnot

Introduction

The nilgai, *Boselaphus tragocamelus* inhabits greater part of the desert and other regions of the country (Frank, 1929) Prater, 1980; Dundar, 1982; Roonwal, 1983; and Prakash, 1986). It is the largest antelope with very wide geographical distribution, in the Great Indian Desert and in the adjoining areas of Haryana, Gujrat and Madhya Pradesh (Majupuria, 1982). It is essentially an animal of arid and dry land, subsisting on xeric plant taxa particularly the herbs, shrubs and grasses which are often avoided by other animals. A hardy animal, it survives in arid conditions and needs little water (Roonwal, 1983). Its ranges are fast declining because of biotic interferences, more prominently being the extension of agriculture. But local people quite often blame this animal for its crop rading behavior and invading agriculture fields and orchards. Villagers have also assumed that the population of Nilgai had increased manifold in the recent past. But, there are no data available which could support this belief or otherwise while the issue remains sensitive so far as its population status and other issues are concerned.

A survey was undertaken for the status of Nilgai in some villages around Jodhpur so as to ascertain its population status and their linkages with surroundings including the alleged damage it causes to agriculture, vegetable fields, etc.

Methodology

Nilgai, *Boselaphus tragocamelus* is a voracious eater. It lives in herds which are of two types, male herds and the bisexual herds. Each herd is led by a physically strong male as its leader.

Under this study villages surveyed are Bhikamkore, Rinia, Gopasaria,

Daijar, Lachhabasani, Boranda and Artiyakallan of Jodhpur district. (latitude $26^{\circ} 18' N$ and longitude $73^{\circ} 08' E$.) Village Manaklao about 22 km. north of Jodhpur city was maintained as the central point. Intensive surveys of 7 villages in the radius of about 50 kms of village Manaklao was made for the presence of Nilgai. A well-planed

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conducted on rohu, mrigal and common carp by varying the ova prim injection time from 7:15 a.m. to 4:30 p.m Khan *et.al.* (1993) Lakra *et. al.* (1996) and Pandey and Singh (1997) have also successfully bread the Indian major carps using ovaprim.

Environmental factors such as light, temperature, water condition, meteorological conditions etc. are known to play important roles in stimulating the release of pituitary gonadotropins responsible for controlling the reproduction of fish. Light is an important factor in controlling the reproductive cycle of these fish species.

Water temperature plays a primary role in stimulating the maturation of gonads and accelerating spermiation. The Indian major carps are observed to breed within a range of temperature varying from 24°C-31°C (Chaudhuri 1960 a). Dwivedi and Reddy (1986) observed that in controlled conditions, the temperature range of 26°C-28.5°C provides the best results of breeding in the Indian major carps. In the present study, the optimum range of temperature varied form 21.6°C to 27.8°C when quality spawn production was obtained.

Successful spawning in a majority of fishes has been induced on cloudy and rainy days (Jhingran, 1983). The carps are found to breed at fairly wide range of pH and dissolved oxygen content (Chaudhuri, 1960 a). The number of spawn produced varied from 0.48950-2.43936 lakhs in the induced breeding exercises.

Conclusion

A single dose administration of ova prim was found to reduce the stress on fishes besides achieving a higher rate of fertilization (50 to 94%) and hatching rates (65 to 90%). The establishment of this eco-hatchery has not only provided the scope to produce and handle mass quantities of eggs but also to a great extent reduced the requirement of water. Thus, this induced breeding technology will help to conserve and propagate the endangered and endemic fishes in this semi-arid part of our country.

Acknowledgment

I am grateful to **Dt. Devendra Mohan**, Associate Professor, department of Zoology, Jai Narian Vyas University, Jodhpur for his valuable guidance and encouragement during the research work.

Abstract

The role of ecological factors on the controlled breeding exercise of *Cyprinus carpio*, *Cirrhinus mrigala* and *Labeo rohita* were studied from 20.12.1998 to 18.08.2000. Water temperature and higher dissolved oxygen were found to play a vital role in the induced breeding exercises. The optimum water temperature range observed for these carps varied from 21.6°C to 27.8°C.

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Table 1: Data of induced Breeding of Carps from 20.12.1998 to 18.08.2000

Carp Species	Injection time variation	No. of breeding exercises conducted	Temp. recorded (°C)	Ratio of male: female brooders	Spawning time (hrs.)	Eggs produced (lakhs)	Fertilization rate (%)	Hatching time (hrs.)	Hatching rate (%)	No. of spawn produced (lakhs)	Average spawn produced from female brooder (1000s)	Loss in weight of male brooder (kg)	
<i>Cirrhinus mrigala</i>	7:30 am to 11.10 am	5	24.6°C to 33.0°C	1.07692:1 to 1.2949:1	8.15 min. to 12.30 min.	1.92 to 3.20	70 to 90 % At 33°C 5% fertilization rate occurred and hatching failed to occur.	32 to 45	79 to 88	1.22400 to 2.43936	72,000.0 to 93821.5	0.182 to 0.252	0
<i>Labeo rohita</i>	7:15 am to 3.30 pm	5	24.3°C to 32.7°C	1.066:1 to 1.200:1	10.10 min. to 14.10 min.	1.00 to 2.72	50 to 85 % At 32.7°C 12% fertilization rate was recorded and no hatching occurred.	30 to 42	80 to 89	0.48950 to 1.94208	25763.16 to 77683.20	0.104 to 0.302	0
<i>Cyprinus carpio</i>	9:00 am to 4.30 pm	11	16.3°C to 25.3°C	1.05128:1 to 1.3333:1	21.35 min. to 70 hrs.	1.15 to 3.45	58 to 94 % At 16.3°C 10% fertilization rate occurred and no hatching was observed.	49 to 87	65 to 90	0.74536 to 2.17833	24845.330 to 55854.615	0.156 to 0.400	0

The presence of *E. Coli*, as indicator species of Faecal pollution in Takhat Sagar

By

G. R. Jakher and Mamta Rawat*

Introduction

Water, the plentiful and replenishable source, is also the most abused one. It is also the main media of transmission of gastro intestinal diseases. Therefore, identification of water pollution based on the presence of coliforms is extremely important. The coliforms not only produce gastroenteritis but also have been incriminated as pathogens for other types of infection (Back et al 1980 and Klipstein et al 1977). The bacterial studies of fresh water reservoirs of India date back by Manoharchary (1979), Manoharchary and Ramarao (1979), Tiwair and Mishra (1985, 1989), Kodarkar et al (1988), Varadaraj and Ayyappan (1989), mwachiro and Durve (1997).

But at Jodhpur, such studies are confined to Rathore (1993).and Gang (1994). In order to assess the existing status of the microbial pollution of the Takhat Sagar, bacteriological survey was carried out at two different sites in 2000.

Study Area

Takhat Sagar, the largest freshwater body of Jodhpur is situated 12 kms N.W. of Suncity (Jodhpur) serving as main surface water impounding reservoir for water supply scheme. It is located at latitude of 26° 16' 30" North and longitude 72° 57' 35" East and receives water from Indira Gandhi canal, though mainly it is rain fed.

Materials and Methodology

Samplings were carried out every month at two stations form Jan. 2000

to Dec. 2000 for the estimation of most probable number/100 ml. The water samples were collected in the sterilized Borosil glass wares and the standard methods of APHA (1985) were followed for the test. The results so obtained were computed by standard table (Table no 1) to categorize the water quality with respect to its use.

Coliform Organisms

Coliforms are the group of bacteria or member of Enterbacteriaceae that generally ferment lactose. Coliform bacteria consist of an artificial group of organisms believed to be associated

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Table No 1- Standard Table

Table no. 1- Standard Table	MPN/100ml	Water Quality
I	0	Excellent
II	1-3	Satisfactory
III	4-10	Suspicious
IV	Above 10	Unsatisfactory

with faecal pollution but in reality may also include environmental organisms from soil, vegetation and decaying organic matter (Randal, 1956, Geldreich, *et al*, 1962, Schubert and Man, 1968).

Most Probable Number

The most probable number or presumptive coliform count is the primary test for the detection of coliform organisms. Water sample in 10ml, 1ml, 0.1 ml amounts were inoculated into lactose broth tubes, which were then incubated at 37°C for 48 hours and coliform organisms were identified by their production of gas from lactose. The positive tubes were then referred to a MPN table.

Result and Discussion

Takhat sagar showed a maximum number of coliforms bacteria in rains (100/100 ml) and minimum in winter (12/00 ml), with a definite seasonal variation (Table II). The water qualities computed from Table No.1, referred “unsatisfactory” water

throughout the year and thus require proper treatment prior to distribution. Similar observations of approximate ranges have been reported by Thomas *et al* (2000) and Senthil Kumar *et al* (2000) in their respective studies. Gnana and John (1998) reported 135 col/ml, which is high value compared to our value. The maximum value at monsoon can be explained on the fact that the rainfall runoff added a major contribution to changes in the bacterial flora.

Verification of every positive coliforms result is good laboratory practice that eliminates all doubts because the test result is perhaps caused due to analogous false reaction. Coliform analysis of drinking water has revealed that as much as 30% of samples having positive presumptive test results may also contain *Aeromonas* (Ptak, *et al* 1974 and Leclerc *et al* 1977). So, a further study of coliform was done, which revealed presence of all the members of coliforms at Takhat Sagar.

E. Coli, an essentially inhabitant of intestine of warm blooded animals, was present throughout the study period and indicated the faecal pollution of recent origin. But the mere presences do not indicate the origin of faecal pollution of human source. It may also be part of other warm-blooded animals wandering nearby in catchment area of the reservoir.

The other "atypical coliforms" like *Klebsiella*, *Enterobacter* and *Citrobacter* no doubt have the disputable source i.e the intestinal one or the contribution of plants (Gieldreich, *et al* 1968). The observations of *E. Coli* and other coliforms in present study are in accordance with the studies of Manujula *et al* (1993).

The overall picture from the above data reveals that the water of Takhat Sagar is not hygienic as it contains indicator organisms of faecal pollution. *E. Coli*, which itself is not a pathogen but indicates the presence of other pathogens like *Salmonella* etc, which may turn up to the outbreak of some epidemics. A few recommendations have been enlisted in order to safeguard the growing threats to sage water.

1. The Carcass dumping site, nearby the reservoir is major contribution of pathogenic strains of bacteria, so this has

to be shifted at some other place.

2. Also this reservoir is the main picnic spot during the monsoon, thus receiving maximum of waste or garbage. So, proper steps for the disposal of the waste should be planned out.
3. Finally a regular monitoring of this natural resource of waterish essential in order to safeguard the water quality with respect to hygiene and also a proper treatment of Chlorination or any other disinfectant is essential before supply.

Table No. II: The presumptive coliform count at Takhat Sagar for the year 2000.

Moths	MPN/100ml
January	17
February	20
March	40
April	35
May	45
June	55
July	100
August	80
September	45
October	20
November	13
December	12

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An Integrated Watershed Development Model For Ecologically Fragile Mountain Ecosystem

By

S.S. Pharatiyal*, Sanjeev Soti**, Dalip Bhatia*** and D.P. Uniyal****

Introduction

A watershed is land area, which drains to a common outlet, the main streams outlet. The area of watershed is generally determined by topographic or watershed divide. "The analysis, protection, repair and utilization of drainage basins for optimum control and conservation of water with due regard to other resource" can be called as watershed management. The first understanding of the model is that of environmental regeneration of mountain ecosystem. The single major problem in the mountain ecosystem is as to how to revive the forest cover, already on the verge of extinction. All other problems, degradation of life support system, scarcity of water, wood and fodder, landslides, siltation of water bodies and increased flood peaks are related to deforestation. According to Singh and Singh (1986) all attempts at aforestation have failed, because of the basic needs of the people viz. firewood, fodder and water, have not been considered. The question is not to plant a seedling but to see it grow into a tree. Plantation can succeed in developed countries where population is confined to small pockets, leaving vast regions physically separate form the people. Further, there the people have other sources of energy, which they can offer because of their affluence.

In the present view the integrated watershed development model for ecologically fragile mountain ecosystem has to be mainly protective, which has to check the flood peaks and the swift down hill movement of soils, silt stones etc, and the productive systems of plains have to take care of needs of food and fibre of mountain people.

Natural hazards in Watershed Development

The Himalaya, the youngest and the most fragile of mountain systems in the world, determine the climate of northern India. This mountain ecosystem is a vast store of natural

resources and more than 5 crore people live here. The steepness of the mountain slopes through which many rivers flow and the inherent fragility has given rise to many devastating floods causing unprecedented damage in the past.

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Floods are the most critical aspects of upper watershed management, which directly affect the lives and property of downstream users. Floods are not caused by human activities but by exceptional atmospheric events. Convergence of flows of moist air concentrate vast amounts of water vapour and cause its precipitation. Another natural cause is a sudden rise of air temperature over snow-clad mountains, as in the Himalayas, which results in rapid thaw and the release of water at high elevations with high potential energy for the transport of soil and rock debris.

Himalayan mountain rivers rank among the world's largest sediment transporting rivers (Planning Commission, Government of India 1986). The Kosi river, for example, carries the heaviest detritus load among all Indian rivers, inundating valley land, silting lakes and reservoirs (Sharma 1996). Although torrential flow of water and accelerated soil erosion are major penalties of land misuse affecting many watershed areas.

The degradation of hillside forests due to fire followed by unskillful cultivation and by severe over grazing of hill slopes, can cause heavy rainfall to be shed as surface run-off instead of infiltrating to recharge the underground water resources. As a result in dry-weather, river flow may

be diminished, springs may fail and streams may dry up seasonally, all the familiar signs of drought are manifested, although the rain gauges show that the rainfall has not declined.

Artificial hazards in Watershed Development

Historical evidence indicate that great civilizations have been destroyed by eco-disasters, such as deforestation soil erosion, salanization of agricultural land etc. The ecological demand caused by man's activities has since long exceeded the carrying capacity of the mountain ecosystems. In watershed development the extractive mining and quarrying industries, road construction in steep hills, faulty land use practices, encroachment of forest area for agriculture, urbanization and deliberate forest fires etc, are major sources of artificial hazards.

The sensitive ecosystem of the U.P. Himalayas has been greatly disturbed by mining and quarrying activities. Such activities on the fragile slopes have resulted in drying up of perennial water resources, siltation and pollution of rivers and streams, landslides and denudation.

The construction of roads in mountainous area without concurrent arrangements for slope stabilization resulted in extensive landslides and to the intensification of deforestation

(Sharma 1996). According to Singh (1992) the construction of 44,000 km. long road in the Himalayan region generated 3650 million m^3 of debris. Each year 550 m^3 of debris per km of road was produced by landslides and rockfalls.

Recently deliberate and accidental forest fires in Uttarakhand region were major artificial hazards to the watershed management. There was immense loss to soil structure, texture, fertility and ground water conservation capacity due to forest fire. In 1995 Uttarakhand witnessed one of the worst forest fires which affected 931 sq. km. area (Mehta 1996).

Integrated Watershed Development Model

Effective planning of land use on watershed must be based on quantitative information on physical resources of climate, topography, soils, vegetation, water resources etc. If watersheds are inhabited, then further information is required on the number and distribution of people and animals, communication, economic and subsistence land holdings and farming system. In order to arrive at a practical solution to the above problems it is necessary to go through the following steps:

1) Reconnaissance survey:

Multidisciplinary reconnaissance teams to assemble information have

become accepted as necessary components of investment in watershed development. This involves survey of several kinds such as soil survey, land capability survey, agronomic survey, survey of forests and land under permanent vegetative covers, engineering survey and socio-economic survey. These surveys are undertaken to ascertain problems both qualitatively and quantitatively, which will serve as guide for fixing priorities in land treatment measures.

2) Promote role of forests:

Worldwide evidence shows that high hills and mountains usually have both more rainfall and more natural forest than do the adjacent lowlands. Forests contribute to the stability of watershed by protecting the soil surface from the direct impact of intensive tropical rainstorms. Rainfall is intercepted by the forest canopy and the foliage temporarily retains a very large area of water films. Additional "detention" storage is provided in organic litter on the forest floor. Water rapidly infiltrates vertically into the subsoil and drains laterally into streams. The overall effect is that forests smooth out the concentrated inputs from intense rainfall and release a more regulated flow to the stream channels (Pereira 1989).

3) Promote agro forestry:

Agroforestry is a general term for the planting of the trees on farm lands

for fuel wood, fodder, poles, shade, shelter and fruits. Tree foliage provide valuable livestock fodder. Moreover, fast growing fuelwood trees can be profitable cash crops when they are produced within the reach of rapidly enlarging urban markets. The watershed manager, therefore, has a compelling interest in promoting the planting of trees on farm land in order to reduce overgrazing and over cutting of steep woodlands. In the longer term, tree planted on farmland will protect soil against wind and water damage, making an important physical contribution to watershed stability.

4) Promote livestock management:

Ill-managed livestock are one of the major sources of watershed damage. This damage occurs throughout the whole range of ecological conditions of steep forested mountain slopes under high rainfall as in Himalayas. Methods of managing livestock that can maintain the stability of watershed slopes and raise the standards of living of farmers are known, but they require major departures from the outdated traditions. In the Himalayan region steep slopes are used for cultivation. These are overgrazed by unproductive and undersized scrub animals, kept mainly to produce manure. Due to overgrazing slopes lose their useful tree species and carry unpalatable shrubs such as Lantana, Berberis and Rhus. As most of the manure is lost on

the hillside, 5 to 6 cattle are considered necessary to provide the manure for growing one-half hectare of crop land (Pereira 1989).

Watershed area can be improved by setting up nurseries and planting fodder grasses and fodder legumes with nitrogen fixing fuel wood tree on denuded upper slopes. By replacing population of unproductive and undersized small hill cows, which give only half a liter of milk per day, by buffaloes or superior breed of cows giving 4-5 liter of milk.

When there will be fodder to cut, all livestock would be either tethered or stall-fed and free-range grazing would cease. A major benefit of the changes will be a big increase in manure collection from the stall-fed cattle and reduce pressure from degraded grazing land and increase milk production.

5) Manage upper watershed:

Major floods are generated by atmospheric concentration of water and energy from areas vastly greater than those of watersheds. Tree planted along roads, river banks and check dams of upper watersheds hold the soil in place. By destroying upper watershed forests and misusing the cleared areas so that soil stability is degraded, human beings contribute directly to flood hazard. Misused slopes are vulnerable to extremes of rainfall, overland flow is accelerated

and soil and debris of rocks and vegetation are torn loose and transported, causing massive deposition and damage in the lower and more restored or developed reaches. The economy of the whole lower watershed is thus depressed. In upper watershed they require engineering construction at substantial, but justifiable cost, check dams of modest size, fitted with controlled outlets and built high in the watersheds are an effective solution.

Government programmes aimed to improve watershed areas have had little success. The solution for these interconnected environmental problems which has been proposed by government agencies is "watershed development". However, officially sponsored watershed development activities, mostly internationally funded, seem to be strengthening the bureaucracy rather than reaching the targeted community. This entire process needs to be critically re-examined by NGOs. In addition the NGOs are further alarmed by the proposed legislation related to forest called the Forest and Ecosystem Conservation Bill, which negates the spirit of Chapter 13 of Agenda 21 to which Government of India is a signatory. This will also dilute the potential gain of the Panchyati Raj Act to truly empower local people to manage their own natural resources and affairs (SBMA 1995).

Majority of the watersheds in the Central Himalaya are of "V" shape with considerable fragmentation of holdings and abandoned land in between. G.B. Pant Institute of Himalayan Environment and Development, Almora, since its inception in 1988, has been working on motivating the people to revegetate these areas and increase their productivity (Kothyari et. al 1996). Overall, the watershed can be sustainable system if specific management options are implemented. Kireet Kumar et. al. (1996) has highlighted the following options for land utilization in the Central Himalayas.

1. It is important to know as to what the land can bear and with what it is suffering from. There is an urgent need to promote sustainable agriculture (Tikao Kheti), which should form the basis of commercial agriculture (Bikao khethi). A Micro Planning Manual should be developed for sustainable land utilization in the region keeping in view the eco-diversity and local priorities of the hill people.
2. The appropriate land reforms including consolidation of land holdings and community participation in the rehabilitation of wastelands, using horticulture and forestry

techniques, should be properly implemented.

3. A holistic watershed development approach has to be adopted. The concept of Bio-industrial watershed management should have the essential ingredients like soil and water conservation and micro-irrigation land development using biological measures and bio-industries for crop processing at the local level.

4. Women's role is pivotal in all life-sustaining activities such as collection of water, fuel and fodder etc.

5. A more scientific and modified terrain-oriented approaches of land use planning is required.

6. Agricultural researches should be focused on dryland agriculture considering the acute shortage of irrigation water in Uttaranchal.

7. In-situ moisture conservation measures should be promoted during all land utilization practices.

8. Reduction of unproductive livestock is necessary for efficient land use planning.

9. As the forest department owns the largest share of land in the mountain region, their role is crucial in sustainable land management. It is therefore, necessary that the forest department should include soil and water conservation in watershed area as one of their main objectives. Forest management considers recent thoughts on sectorial approaches based as restoration forestry, conservation forestry, agro forestry and industrial forestry.

10. Civil soyam forests should come under joint forest management (JFM)

11. Implement the Sloping Watershed Environmental Engineering Technology (SWEET) developed by G.B. Pant Institute of Himalayan Environment and Development, Almora as some pattern of SALT (Sloping Agriculture Land Technology), a modified version of Alley Cropping or conservation farm system. SWEET based on behavioral ecological approach, in which attitudes are more important than facts. The technology is broad framework of integrating scientific, social, economic and cultural ingredients for achieving the

objective of socio-economic development together with environmental regeneration/conservation. The main elements of this technology package are protection of grazing land, waste water

harvesting, providing quality green fodder, crop diversity and crop rotation, selection of tree species, nursery practices and plantation and soil management.

Abstract

The need for an integrated watershed development is due to requirement of regenerating water, forest, soil, horticulture and livestock with a view to ameliorating environmental destruction and at the same time having local people's access to a constant supply of nature's products such as drinking water, water for irrigation, fuel wood, wood for construction work, fodder, mineral and other non wood forest products (NWEP) for their subsistence. It is evident that agriculture based economy need to be designed keeping in view local people's active involvement in decision making.

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Sighting of Vultures

By

A.M.K. Bharos*

The Indian white backed vulture (*Gyps benghalensis*) and other vultures have become so rare that they have totally disappeared from certain areas even in this region and sighting of even a solitary bird causes lot of excitement.

In the recent past following sightings were recorded:

On 7 October 2001 a gathering of 18 birds was observed soaring near village Shirpur, Baghnadi situated on Raipur- Nagpur road (NH-6). This gathering comprised 18 birds, out of which 16 were Indian white backed vultures, a King vulture and one was possibly an Indian long billed vulture. They were moving away and few of them were in the process of descending, suggesting the presence of a carcass and more birds there.

Earlier in the month of march 2001, during survey of IBA sites, nesting colony of Indian white backed vultures, with four active nests was located near village Rampur inside Barnawapara Wildlife Sanctuary, in Raipur district, Chhattisgarh Around this locality a gatherig of 16/17 birds is regularly seen.

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A Nature-Lover's Unnecessary Concern For Wildlife in Afghanistan

By

Brig. R. Lokarajan (Retd)*

The winter is ending now in Afghanistan. The breeding season begins for some birds there, like the Monal (*Impeyan Pheasant*), which inhabit places in the Himalayas also, from Kashmir across Bhutan to the north-east of Assam. I have seen a few in Kashmir, Himachal Pradesh and Bhutan in the course of my army career. The other day I happened to glance at a photograph taken by me of a pair of monals from a painting done so splendidly by whom I do not know. It was not signed. It fascinated me and a friend of mine who showed it to me many years ago and I could not resist photographing it to keep. Seeing it now the picture brings to my mind what human interference in parts of Afghanistan due to al-Qaeda and Taliban fighters will cause to wildlife. Devastation quite unintentional to birds and animals will occur in every place where this is happening. The monal will be one of the many birds and animals affected.

The male monal's plumage excels, in my opinion, even the brilliance and radiance of gemstones, precious and semi-precious which have to be cut and polished to bring out their dazzling appearance. Seeing a male monal in sunlight is overpowering. I could express this by stating rather imaginatively that this sight could turn an atheist to an agnostic! I will describe this pheasant by some of the words used in K. N. Dave's book "Birds In Sanskrit Literature" and Dr Salim Ali's "Indian Hill Birds" suitably extracted by me. The male monal's colouring is a metallic green, copper and purple. Its breast is velvety-black, with the skin in the area around the eye and the cheeks, shades of brilliant ultramarine blue. The crest is a wire-like spread of feathers with a colourful blue-green tuft as it appears to me. It is unlike the peacock's crest. The tail is square-cut, not long like other pheasants, and is of cinnamon chestnut colour. A white patch occurs on its back. The hen monal is an ordinary brown, mottled and streaked dark and pale, and it has a white throat. Its crest is a laid-back few short feathers.

Among the many other birds and animals being disturbed are the Chukor and Snowcock, animals like Urial, Marco Polo Sheep, Ibex, Bharal, Markhor and possibly Wild Yak. My unnecessary concern is the concern of a nature-lover, taking some interest in wildlife. My fond hope, laughable as it is, is that by some unexplainable, strange or surprising instinct, these fauna will keep out of the way of harm— guns and bombs blasting their natural habitat, whether pastures or mountainsides or tops. This hope I supplement with some kind of prayer being fully aware that Whatever Will Be, Will Be- "Que Sera Sera!"

Joint Forest Management (JFM) in Madhya Pradesh

By

Dr. R.B.S. Kushwah*

The state of Madhya Pradesh has a vast tribal population, which is directly dependent on forests for its subsistence. People who were traditionally doing the forestry operations for various activities, now have come forward for cooperation in the forestry operations like forest fire control and tendu shrubs pruning. Forest department of Madhya Pradesh, in turn recognized people's certain obligations and rights of forests and forest produce. The MOEF letter of 1990 paved the way for the JFM in India, which stressed on a 'care and share' principle. Considering the emphasis of NFP, 1988 on people's participation and moreover, adopting the guidelines laid in the above circular (June 1, 1990 proved to be the watershed in the history of India's forest management). GOMP geared itself to make appropriate changes in its forest management policies and practices to fulfill the new objectives of these. GOMP passed a resolution in December 1991 (order no. 16/4/10/2/91 of 10.12.1991) for Community Participation in preventing illicit felling of tress and rehabilitation of the degraded forests. This order prescribed the formation of two kinds of village committees, viz., Forest Protection Committees (FPC) and

Village Forest Committees (VFC). The FPCs were to be constituted in sensitive forest areas where as the VFCs were to be constituted in villages adjoining degraded forest areas. The aim of the first kind of the committee (FPC) was to protect the existing good forests from damage by illicit felling, encroachment and grazing where as that of second kind (VFC) was to regenerate and rehabilitate the degraded forest areas with the consent and co-operation of local people.

This GOMP resolution of 1991 contained the details of procedures for constitution of these committees, their duties and responsibilities of the Forest Department and the usufruct benefits to the members of the committees. This resolution, which was revised later on from time to time in order 'taking care of' various shortcomings and lacunae of the earlier resolutions, has become the main guidelines and guiding principle on JFM in Madhya Pradesh. It makes an attempt to explain various issues and line of action in clear perspectives. It has ensured proper representation of executive body of the committees along with the various rural development activities in the village-viewing village resource

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development as a complementary activity to forest protection. In the last eight years most of the Indian States have facilitated its implementation in their territories by issuing enabling orders/resolutions. There are now nearly 10,000 forest protection committees, responsible for the management of 2 million hectares of forest in ten Indian states (Miller et al, 1995). There are 9,509 JFM communities (4389 FPCs and 5120 VFCs) working in the State of Madhya Pradesh.

Actions taken by the GOMP to promote JFM

The GOMP is doing earnest endeavour to boost up the progress of JFM in the State. Several decisions have been taken to make appropriate amendments in existing policies and suitable guidelines have been issued to facilitate the process of JFM throughout the State. Efforts have been done to strengthen the participatory approach through developing a support system. Integration of JFM with rural development has been ensured in village level microplanning. The JFM has been recognized as the future strategy of the forest management in the State. Some of the important decisions of the GOMP regarding JFM are:

1. New government resolution (1995) on JFM in Madhya Pradesh
2. Adoption of microplanning approach for integrated forest and village development

3. Amendment in State 'Nistar Policy'
4. Measures for inter departmental co-ordination in village micro planning
5. Relaxation in transit rules
6. Discontinuing contract with industries

New government resolution (1995) on JFM

Based on the experience in implementing the 1991 JFM resolution in the State, it was sought to make certain amendments in this document for making it more effective and widespread. The new resolution has tried (i) to accelerate various shortcomings, practical problems faced in the earlier resolution along with the addition of the village development component to the forest department works; (ii) it endeavours to bridge the gap between the FPC/VFCs and the newly elected 'Panchayat Raj executives'; and (iii) adoption of micro planning approach for forest management as well as VRD (Village resource Development), with the active participation of people.

Adoption of integrated micro-planning approach for forest and village development simultaneously

The GOMP has recognized village level participatory micro planning as the future strategy, as mentioned in the JFM resolution. The village level

micro-plans will be of two kinds, in order to keep the planning process same:

1. Micro-plan for forest and village development: A ten-year document to be prepared by joint-efforts of FD and the VFC for the development of degraded forest areas and adjoining villages.
2. Village Resource Development (VRD) Plan: A separate VRD Plan is to be formulated for FPC areas, which will be operative in 'good' forest areas.

The GOMP has also decided that in degraded forest areas allotted to VFCs, once a micro-plan is approved and becomes operative, the traditional forest-working plan will be deemed to be suspended. Such participatory approach will, beyond doubt, strengthen the village level institutions and facilitate the process of JFM in the remotest areas of the State.

Amendment in State 'Nistar Policy'

This is one of the most significant and bold steps taken by the GOMP for the cause of JFM. The existing Nistar system referred to distribution of forest produce at concessional rate to all villages without concessional this stake of forest protection. The new nistar policy promulgated by the GOMP (in December 1994) gives more importance to villagers who are playing, or are capable of playing

significant role in the forest protection. According to the new provisions only those villages will be entitled to nistar concessions, which fall within 5 kms periphery of the forests. The remaining villages will have to purchase forest produce at market rates. In the villages where VFC/FPC are in existence, the nistar requirements of the villagers will be fulfilled through these committees only. As per new arrangements, the members of the FPC will now be getting nistar forest produce at 100% concessions in royalty and the members of VFC will be entitled to 50% concession in royalty. Only extraction and haulage expenditures will be charged.

Measures for inter-department co-ordination

Inter-departmental co-ordination assumes significance in view of the proposed integration of VRD activities with that of forest protection and management. Forest department alone cannot contemplate the development of villages in isolation due to meager budgetary allocations to forestry sector. The GOMP has announced from time to time various schemes for different other State departments, the miracles may be done with the 'integrated approach' the inter-departmental coordination. Members from all the departments, which can play role in rural development, have been given representation in VFC/FPC. The DFO at district level, the Conservator of Forests (CF) at regional level and the Chief

Conservator of Forests (CCF) at the State level will be the member secretary of these inter-departmental committees. Necessary instructions for operation of these committees have already been issued by the GOMP.

Relaxation in transit rules

GOMP vide its letter (no. F-30-40-95-X-3 (1) dated 19th October 95) has exempted timber of some 16 and fuel wood of all the tree species but for 10 out of 16 species transit pass issuing power has been given to Panchayats (the local body), so only 6 species require transit pass from forest department authorities.

Discounting contract with industries

GOMP (vide its letter no. 30/6/94/10/3, dated 18th October 1994) has decided that under the current rules/act contracts of forest produce should be discontinued from 30th June 1997. The contracts under progress if expire before this deadline; will not be renewed but on the basis of free equal treatment forest produce can be made available to them annually according to market rates.

A few Success stories of JFM in Madhya Pradesh

Table 2 shows the Forest circle-wise progress of JFM in Madhya Pradesh. The data reveal that Sarguja circle (with 1,498 JFM communities) followed by Bilaspur circle (with 1,414 JFM communities) leads the tally in number of JFM communities

already formed successfully. But the success stories narrated here have been taken from Harda division (Hoshangabad circle), Jhabua division owing to their best first ever work in the field of JFM in the State.

Harda, Jhabua, and many other Forest Divisions of the State speak themselves about few of the success stories of JFM. The success story of Harda (in the Hoshangabad district), which was earlier known to be worst affected by illicit felling and other forest offenses, may be called the hallmark of JFM in Madhya Pradesh, has been widely acclaimed by various groups of people (including politicians, bureaucrats, NGOs press and media, foresters and officers from other departments). The Chief Minister of the state also visited Harda during February 1995. Representatives from more than 20 different countries have so far visited the place and appreciated the efforts done by the FD in transforming an indifferent and conflicting rural mass into well-organized guardian of the forest. But the success did not appear in a fortnight, as 'Rome was not built in a day'.

The systematic PRA approach was adopted after convincing the staff first and then people. A teamwork supported by committed and dynamic leadership succeeded in waiving of the initial doubts, fears and suspicion amongst the forest staff. The perseverance of efforts and dedication

towards the goal helped in changing the attitude of forest staff who had a role to play as the crusaders of JFM in their respective areas. Simultaneously, attempts were made to develop a rapport with the villagers located in the vicinity of the forests. Regular interaction and several meetings with villagers resulted in confidence building in both villagers as well as forest staff. Initially people from only a few villages were convinced and expressed their willingness to join hands with FD, but soon most of the people (specially poor and resourceless from the nearby villages) realized the great potential; of the new 'integrated approach'. The immediate requirements of the villages (mostly infrastructure, development works, irrigation, etc.) were fulfilled which paved the way to more prosperity in terms of 'cash crops', which ultimately strengthened the VFC/FPC. The increase in the employment generation activities also reduced the biotic pressure on the adjoining forests to some extent on one hand and the village resources were developed on the other simultaneously. The 'taste' of initial success motivated both— the staff and the people and more and more villages were attracted towards the JFM and thereby the people's participation went on increasing in the 'geometrical progression' with 15 VFCs and 196 FPCs to its credit by the year 1991. The works of these committees (FPC/VFC) includes compounding of the POR cases (9 cases were compounded during Nov.

1991 to march 1992), imposition of fines to forest offenders (Rs 6, 150 during Nov. 1991 to March 1992), etc. The fines in terms of 'social boycott' also included in the list in addition to the monetary penalties' (MPFD 1997).

The Jhabua forest division (in the district of the same name) lies in the extreme western corner of the State adjacent to Panchmahal and Baroda districts of Gujrat State. The FPCs reduced not only the average number of forest offenses (from 69 to 57) but also the value of these (from Rs 1,09,958 to Rs 32,169) in the very first year. The 'Eco-development activities include sharing of benefits in terms of the 'nistar' (net benefits of Rs 2,98,512 during 1991-92). Infrastructure development works in the villages (specially drinking water, irrigation, etc— of Rs 3,59,813) distribution of food grains, soil and water conservation works, etc.

The success of JFM depends mostly on motivating people which in turn requires persistent and sincere efforts along with the 'direct and informal contracts with the people. The in-depth studies of the local problems by 'involving people actively' will certainly enhance this 'contract process'. The strategy for Village Rural Development (VRD) Programme had been:

- increasing the stake of neighbouring committees in the management of the forests;

- creating alternative sources of income and employment generation inputs to reduce the pressure on the forests.

Constraints in implementing JFM

The past experiences have shown that the main constraints in implementing JFM may be as follows:

- socio-political
- economic (lack of budgetary allocations)
- ecological-habitat destruction for wildlife
- dis-empowerment of communities
- lack of instructional support
- absence of legal framework
- new international developments

The Socio-political and economic relation of forest users has often been one of the mistrust. The budgetary allocations to the forestry sector have always been meager. There is almost no legal framework existing for the committees. Only very few NGOs have come forward for their institutional support to JFM activities. The task of planning and implementation of 'forestry management systems' in the areas suitable to wide range of agro-environmental conditions and local needs is not so easy which requires mutual communication, devolution of responsibility and initiatives, etc. Efforts are being made at Forest head

Quarters, Bhopal to identify and understand various constraints of the process. A number of workshops, seminars, orientation camps, etc. have been organized recently (specially after the implementation of the 'World Forestry Project' in 1996) in the different parts of the State where 'feedback from the field succors to formulate the appropriate future strategy for overcoming the constraints.

The future strategies of JFM/JPAM In Madhya Pradesh

The future strategy for JFM/ JPAM in Madhya Pradesh has been drawn on the basis of the past experiences and future requirements which emphasizes the change from 'traditional approach' to integrated approach'. The three essential elements are necessary for formulating the future strategies for JFM/JPAM: (1) conservation of biodiversity, (2) sustainable use of its components, and (3) the equitable sharing of benefits must be integrated in order to slow down the rate of loss of biodiversity and to enhance its contribution to development (Rio Convention, 1992). The Rio Convention (1992) does specifically address the issue:

"Nothing that where there is a threat of significant reduction or loss of biodiversity, lack of full scientific certainty should not be used as reason for postponing measures to avoid or minimize such a threat."

The GBA (1995) has provided an over-arching conceptual framework for handling the enormous challenges involved in developing an integrated approach to conservation. The key strategies include 1. Conservation approaches, 2. Improving the knowledge base, 3. Human and institutional capacity and 4. Global and national coordination.

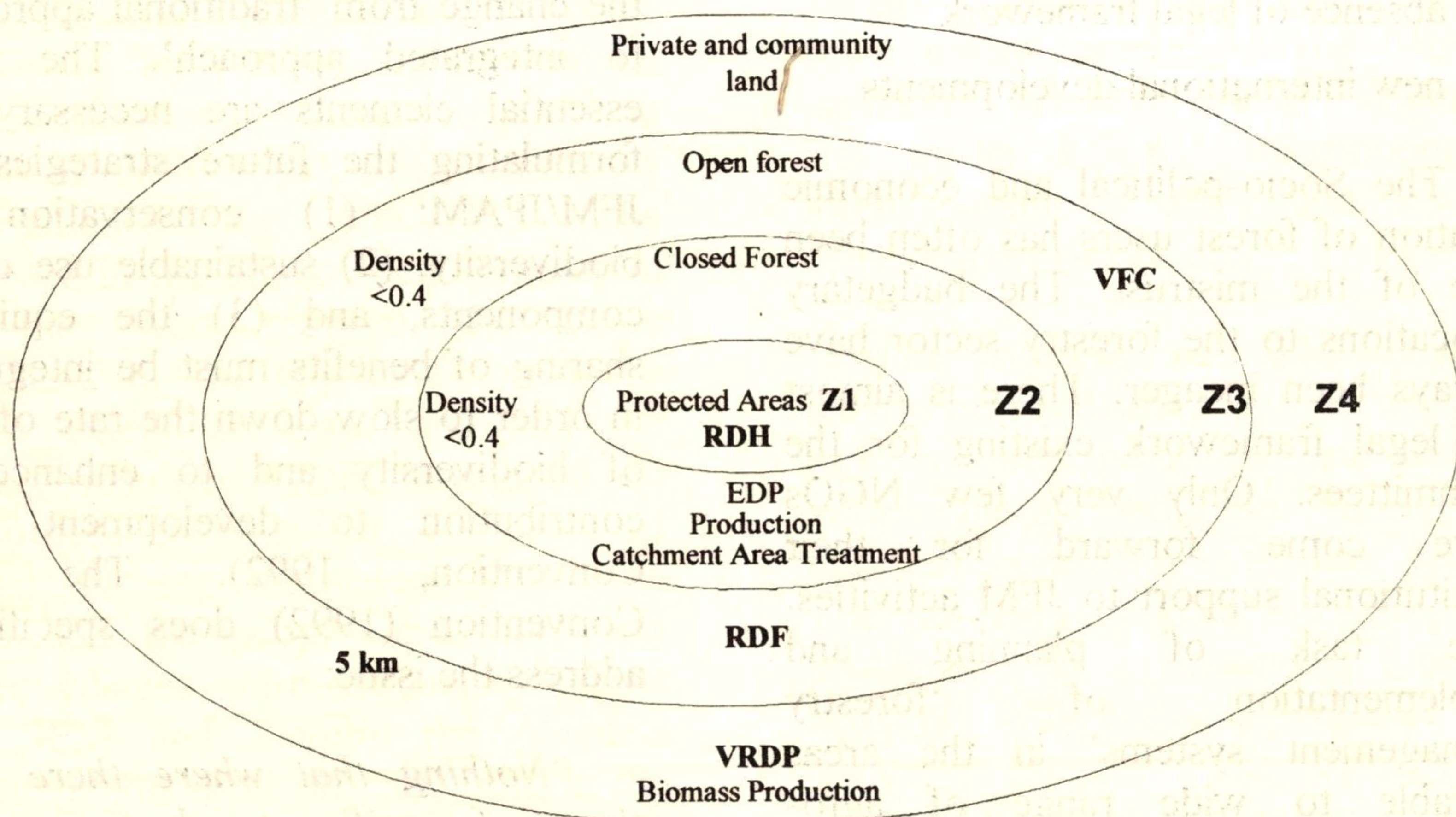
A mechanism is being gradually developed and policy level changes are likely to be fabricated to suit the new requirements. The structural components of the 'Madhya Pradesh World Forestry Project (WFP)' (BOX-1) automatically facilitate the propagation of JFM in the state in which JFM have been assigned the

pivotal role in different activities related to VRD and forest protection.

Forest Land Zonation concept

The concept of forest zoning is universally accepted today and its application has been rather tardy in different parts of the country. The Madhya Pradesh concept of ZONING emphasizes four concentric rings as shown in Figure 1.

Zone-1 (Z1)- the Protected areas, which is earmarked for Global Benefits and would house comparatively high biodiversity levels. The global interest could be in game pool and preservation of species for long-term future use.



- Z1** Protected Areas (National Parks and Wildlife Sanctuaries)
- Z2** Closed Forests outside the PA (Density >0.4)
- Z3** Open Forests (Density <0.4)
- Z4** Private and Community Land

- RDH-** Rehabilitation of Degraded Habitat.
- RDF-** Rehabilitation of Degraded Forest.
- VFC-** Village Forest Committee
- FPC-** Forest Protection Committee
- VRDP-** Village Resource Development Programme
- EDP-** Ecodvelopment Programme

Zone-2 (Z2)- is the closely forested areas with crown density above 0.4 level. The zone has been specifically car-marked for productive purposes (supplies to industry and trade establishments). Water course management. Supplying certain species minor and major forest produce. Also incorporated in this zone are the village Development Programme initiatives.

Zone 3 (Z3) – is the degraded area with reduced crown density. In focus here are forest restoration plans, community sustenance initiatives. These open forests are to be handed over to communities for forest management through empowered. Sharing of gains from forest produce in zone-3 has been prescribed on a 70% to government and 30% to community basis.

Zone-4 (Z4)- is the private and community land mostly under private control. The Government policies and practices proved as disincentives for the growth of forests in this zone.

To accelerate community development and to promote industrialization various regulatory practices have been relaxed (like land revenue codes, industrial policies, and transit rules). The majority of the so-

called forest habitats are located in zones-2 and 3. Zone 4 houses industries, urban and semi-urban locations, agricultural communities and provide the access route for the outside world of the forests. While zoning has been resorted to protect forests, enrich Eco-development, reduce alien intrusion into forest for exploitation, preserve biodiversity and bring about an amicable and gainful inter-dependence between forests-communities and forest based industries. There is little realization of these exceptions. Based on the approach of zoning, the future strategy for community involvement in Forest management are illustrated in Box-4 and Box-4A. The strategies for the Zone-1 areas will be (based on the VIIIth. Five Year Plan document, GOI):–

1. To enhance PAs network and corridor linkages.
2. Improve the management of PAs as per scientifically prepared management plans.
3. To continue an augment special projects, programmes for endangered species.
4. To promote better management of zoological parks
- and 5. To resolve interference conflicts pertaining to Eco-development around PAs with full and active involvement of the local people (JPAM).

Box-3

Madhya Pradesh World Forestry Project

This project was approved in February 1995 with total project cost of \$ 67 million. This project supports improvements for the Madhya Pradesh forestry sector, including innovative programmes for participatory FM. It involves forest regeneration and improved silvicultural practices, improved implementation, monitoring and evaluation; a VRDP based on participatory planning and the integration of FM and protection with activities to generate income to reduce pressure on the forests, forestry research, extension and biodiversity conservation through management of 12 (out of 45) PAs while supporting the development of alternative sources for local communities. (Source: Wasteland News 1998, Vol. 13 (2) 64)

Box-4**Management objectives and the future strategy for JFM/JPAM in Madhya Pradesh**

Zone	Area	Management objectives	Strategies
1	Protected Areas (PAs)	● Maintain sample ecosystem in natural state ● Maintain ecological diversity and environmental regulation ● Conserve Genetic Resources ● Provide recreational and tourism services. ● Protect sites and objects of cultural and archaeological heritage ● Protect scenic beauty and open space ● Stimulate rational, sustainable use of marginal areas and rural development. ● Provide education, research and environmental monitoring. ● Control erosion, sedimentation and protect down-stream investments.	● To enhance PAs network and corridor linkages. ● Improve the management of PAs as per scientifically prepared management plans. ● To continue and augment special projects programmes for endangered species. ● To promote better management of zoological parks and organize need based effective programmes for captive breeding of endangered species and ● To resolve interference conflicts in Eco-development around PAs with full and active involvement of the local people (JPAM). ● Enhancement of the economic status of the local people (the resource users) and reducing their resource dependability by village micro planning.
2	Closed forests (crown density more than 0.4)	● Maintenance of forest cover by adopting appropriate protection measures. ● Provide education, research and environmental monitoring services. ● Stimulate rational, sustainable use of marginal areas and rural development. ● Protect sites and objects of cultural and archaeological heritage. ● Protect scenic beauty and open space.	● Elimination of forest fires, grazing and illicit felling with active participation of JFM committees; ● Improvement in forest floor management Adoption and protection of existing seedlings. Soil and water conservation measures. ● Income generating activities for villagers (VRDP projects) ● Conservation education and nature interpretation packages.

3.	Open forest (crown density less than 0.4	● Increase in forest cover and rehabilitate degraded areas. ● Production of forest produce for community's bonafide needs. ● Protect sites and objects of cultural and archaeological heritage. ● Protect scenic beauty and open space. ● Reduce people's dependability on forests.	● Elimination of forest fires, Grazing and illicit felling with VFCs active role. ● Support to naturally occurring rootstock. ● Cut back operation ● Soil moisture retention works ● Production of small timber and fuel wood ● Energy saving devices. ● Environmental education.
4	Private land holdings	● Increase in 'Tree cover' on areas outside forests. ● Promotion of 'Tree farming' by farmers on a large scale. ● Encouraging 'high-techs' to increase the economy. ● Ensure better marketing prospects of the Timber and NTFPs	● Encouraging commercial forestry through a 'Tie up' programme between forest based industries and private tree growers. ● Industrial liaisoning at Division and district levels ● Live contact with FD/IIFM/ILU at Bhopal ● Extension programmes.

Source: modified MPFD, 1997 as quoted in Kushwah, 1998 b)

Box-4 A

Conservation objectives of the protected areas in Madhya Pradesh

Primary Conservation objectives	Priorities	
	IUCN-II (National Parks)	IUCN-IV (wildlife-sanctuaries)
1. Maintain sample ecosystem in natural state	1	1
2. Maintain ecological diversity and environmental regulation	1	2
3. Conserve Genetic Resources	1	1
4. Provide education, research and environmental monitoring	2	1
5. Conserve watershed conditions.	1	2
6. Control erosion, sedimentation; protect downstream investments.	3	3
7. Provide recreation and tourism services.	1	3
8. Produce timber, forage or marine products on sustained yield basis	-	3

9. Protect sites and objects of cultural, historical and archaeological heritage	1	-
10. Protect scenic beauty and open space	1	2
11. Maintain open options; manage flexibly; permit multiple use	1	-
12. Stimulate rational, sustainable use of marginal areas and rural development	1	2

Note:- The numbers 1, 2, and 3 indicate the priorities of the objectives:

1. Primary objective for management of area and resources;
2. Not necessarily primary but always included as important objectives; and
3. Included as an objective where applicable and whenever resources and other management objectives permit.

(Source: modified IUCN 1988 as per IUCN 1994 by Kushwah, 1996)

Ensuring women's participation

Box 5 gives the highlights of the GOMP policy on women's participation. The JFM resolution (revised in the year 1995) makes provisions for women's participation in the process. As per this resolution:

- A female member from each family has to be represented in the general body of the VFC; and
- At least two female members should be included in the 'executive body' of the VFC.

The strategy to address the gender issues has been formulated as under:

1. Clearly defining the role of female VRD trainers included in the VRDP spearhead team.
2. Determining explicitly the facilities to which a female

VRD trainer included in the VRDP spearhead team is entitled.

3. Developing a monitoring and support system to review gender specific issues at regular intervals.
4. Creating awareness amongst male VFC members and forest staff and sensitize them for gender related issues.
5. Strengthening women's position in VFC/FPC by giving greater and regular emphasis to gender issues.
6. Women members of the executive body of the VFC to be imparted training and used as a trainer in gender sensitive planning and monitoring.

Box-5**Highlights of the GOMP policy on women's participation.**

The GOMP's policy of women is committed to the improvement of the conditions of life and works of women in the forestry sector. GOMP has made following assurances:

1. Make sure that wages in tendu patta leaf collection is handed to the women in the household.
2. Increase women's membership in MFP cooperative societies to at least half of their strength.
3. Give greater managerial roles and the necessary training to women engaged in tendu leave collection. At least 50% posts of the 'fad munshies' will be reserved for women.
4. Provide sheds in the tendu leaves collection centers where potable drinking water, rest and child care facilities are available for the women engaged in this work.
5. Strengthen and safeguard the women's role in the collection, processing and marketing of other MFP by the formation of women's cooperatives and the inner linking of ongoing development programmes like DWCRA, TCS (Thrift and Credit Societies), etc. and the support of the MAVN (Mahila Arthik Vikas Nigam.)
6. Find ways to improve the quality of life inside the forest settlements to reduce on women the burden of household sustenance under exceptionally trying conditions. To this end, institute provisions for better health care, education, sanitation and safe drinking water in the forest settlements.
7. The GOMP will provide access in non-conventional energy sources like solar panels for lighting and the installations of community gohar gas plants for meeting women's domestic energy needs.
8. Women will be recognized as equal partner in the tendu patta and JFM programmes with an assured 50% representation. Women's participation in the Women's cooperatives to take up forest protection and nursery raising activities will be promoted.
9. The GOMP will introduce welfare measures to reduce the occupational hazards of women working in the forestry sector.

(Source: MPFD, 1997)

Nodal development role

There are 70,000 villages in and around the forest area in Madhya Pradesh and the people of these

villages are dependent highly on forests for their sustenance. The development activities of these villages and of the forests has to go together adopting the 'integrated

approach'. Serious attempts are essential for research and extension works in areas and 'specific silvicultural models' are needed. Government Research and Development agencies and NGOs may come forward for their vital roles.

The various techniques of communities participation in the management of various resources, as practiced in the various parts of the world are: PRA (Participatory Rural Appraisal), RRA (Rapid Rural Appraisal), PALM (Participatory Learning Methods), AEA (Agro-ecosystem Analysis), FSR (Farming Systems Research), RAP (Rapid Assessment Procedures), PAR (Participatory Action Research), RRSA (Rapid Rural System Analysis), etc. the first one, the PRA technique is widely used in India including Madhya Pradesh. The future strategy for JFM in Madhya Pradesh advocates that 'gram Panchayats' and 'local gram Sabha' should also be involved in the PRA and decision-making processes of JFM, JPAM. The gender and equity implication have to be discussed deeply and suitable arrangements to be made to rectify the imbalance. Extensive 'case studies' to be done through suitable NGOs and models to be decided for different agricultural and cultural zones (MPFD, 1997).

The Feed back from a workshop

A workshop was organized recently in Rewa Circle of Madhya

Pradesh (India) on 26th and 27th March 1999. 7 Divisional Forest Officers, 16 Sub-Divisional Forest Officers, 16 Range Forest Officers, 22 Deputy Rangers and Foresters, 29 Forest Guards and as many as 100 plus executives from local VFCs/ FPCs (including Presidents/ Vice-presidents/ Secretaries) participated in this workshop. The training components of this two days workshop included the discussions on relevant issues such as protection of forests by community-based conservation, field demonstration of PRA techniques, group discussions, presentations, etc. The group leaders presented the summary of their discussion outputs. The active participation of each member was ensured. It was one of the objectives of the workshop that everybody should come forward to say something, may be first time. Some of the participants were little hesitant in the beginning, but they came forward in course of time. It was also essential at least from this platform of the workshop to enable them to discuss the practical problems and seeking their solutions in presence of the senior forest officers. Moreover, for Rewa circle where the JFM is quite new and is taking shape slowly but steadily it is essential that the coordination between the people and the staff must be ensured. Their difficulties should be resolved in the healthy atmosphere with taking due care of everybody's participation. The workshop also took

due care to increase the knowledge of the participants regarding the new techniques, e.g., hi-tech nursery and plantation methods with their discussions in the respective groups and by individuals, and also supplemented by their demonstrations in the field by experts. The interesting aspect of the workshop was the feedbacks from the participants, the results of which were quite interesting. The data reveal that the proper arrangements should be done regarding the publicity and extension.

One interesting thing was the fact that 'the immediate senior officers' are not cooperating properly. The other ones are that 12.5% of the ACFs, 37.5% of RFOs, 22.5% of Deputy RFO/Foresters, 5.7% of forests guards, and 5.0% of JFM executives from local people present were mentally prepared for JFM/JPAM. Almost all responded in affirmative regarding the increase in their workloads and responsibilities in the new system. More than 60% among all responded that better forest protection is secured in JFM.

Table-1

The shift of approaches from 'before' and 'after' JFM/JPAM in Madhya Pradesh

Sl. no.	Before JFM/JPAM	After JFM/JPAM
1	Centralized management	Decentralized mangament
2	Revenue orientation	Resource Orientation
3	Enrichment to government exchequer	Benefits to forest department and people both
4	Monopoly in trade	Concerns for equity and gender
5	Production motives	Sustainability
6	Single products	Multiple products
7	Large Working Plans	Micro-planning
8	Target orientation	Process orientation
9	Unilateral decision-making	Participatory decision-making
10	Controlling people	Facilitating people
11	Government Department	People's institution
12	Assumed homogeneity	Recognizing diversity
13	Achieving single pre-set objectives	Fulfilling multiple, need-based objective
14	Area as a whole management	Site specific mangament
15	Timber production	Multiple products with diversity
16	Fixed procedures	Experimentation and flexibility

17	Plantations as forest option	Low input management and regeneration (e.g. ANR- Assisted Natural Regeneration, etc.)
18	Single species	Multiple species and multiplier plantations
19	Restriction in movement of forest produce	Deregulating movement
20	Silviculture system	Siliviculture system to link rural maximize valuable timber production poverty and people's need.

Table-2

The progress of JFM in Madhya Pradesh

<i>Name of Forest Circles</i>	<i>FPC (No.)</i>	<i>ITC No.)</i>	<i>Total (No.)</i>
Balaghat	133	64	197
Betul	283	96	379
Bilaspur	474	940	1414
Bhopal	124	148	272
Chhatarpur	101	79	180
Chhindwada	212	144	356
Durg	238	160	398
Gwalior	15	28	43
Hoshangabad	251	136	387
Indore	55	491	546
Jabalpur	277	282	559
Jagdalpur	166	20	186
Kanker	454	147	601
Khandwa	123	227	350
Raipur	403	432	835
Rewa	84	159	243
Sagar	106	143	249
Sarguja	591	907	1498
Seoni	72	68	140
Shahdol	209	199	408
Shivpuri	17	37	54
Ujjan	11	146	157
Total	4389	5120	9509

(Source: MPFD, 1997)

Conclusions

The future of JFM/JPAM is bright in the Indian State of Madhya Pradesh. The GOMP has taken many policy decisions to enhance JFM and moreover to overcome the constraints in the way of community-based conservation of natural resources. The various issues are needed to be given more careful attention such as:

- The *constraints* like socio-political, economic, ecological, lack of institutional support, and absence of legal framework, etc. need to be solved with proper care.
- The *laws and policies* regarding JFM have to be tackled by identification of stakeholders, flexibility, equity economic considerations, feedback from field, etc.
- The *rights and concessions of the local people* have also to be considered properly, although few steps have already been taken by GOMP on this issue.
- The *Capacity-building programmes* have to be taken up towards increasing knowledge of partners of JFM/JPAM.
- The *institutional structure* has to be enhanced in such a way ensuring the overall development of the area after

taking into consideration the social needs of the communities.

- The *outsider's role* has to be clearly classified and defined as the worldwide NGOs and other outsider agencies/individuals have played and are playing their important roles in JFM/JPAM.
- The great enhancement in the publicity and extension services are call of the day at least in Madhya Pradesh as was the unanimous opinion of all the participants of the workshop.

The future strategies regarding JFM/JPAM in Madhya Pradesh will have to include:

- The forest land zonation concept
- Formulation of separate strategies for each zone, and
- Ensuring women's participation.

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and timely support without which this stupendous task wouldn't have been completed in time.

Abbreviation used in this paper

FD= Forest Department; FPC= Forest Protection Committee; GOI= Government of India; GOMP= Government of Madhya Pradesh; IIFM= Indian Institute of Forest Management; JFM= Joint Forest management; JPAM= Joint PAs Management; NGO= Non Government Organisation; PAs = Protected Areas; VFC= Village Forest Committee.

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ऊदबिलाव : मोम का पुतला

लेख एवं फोटो : रामेश बेदी*

क्या मैं छलावे की लीला देख रहा था: अजीब –सा शोर सुनकर मैंने नीलधारा की ओर नजर दौड़ाई। मैंने सोचा कि जलकौए या दूसरे पक्षी मछली पकड़ रहे होंगे। और, उन्हीं का यह शोरगुल होगा। उड़ती नजर से मुझे कुछ दिखाई नहीं दिया। मेरा कुत्ता ठहर गया था। उसने अपनी आंखें एक जगह गाड़ रखी थीं। मेरी निगाहें भी उस ओर पानी में कुछ खोजने लगीं।

एक बड़ी गेंद लुढ़कती जा रही थी। पलक झपकते वह अदृश्य हो जाती और फिर पानी के ऊपर बहने लगती। क्षण भर में मुझे लगा कि यह भूरे रंग के मुलायम रोओं से मढ़ी हुई एक गेंद हैं प्रभाव के बालरवि की सुनहरी किरणें पड़ने से उसकी चिकनी सतह शीशे के समान चमक उठी। देखते ही देखते गेंद बिखर गई। उसके कई हिस्से धारा में बह रहे थे। प्रभातकालीन सैर पर मैं धारा के रुख की ओर ही नदी-तट पर जा रहा था। मैंने देखा कि बिखरे हुए अंग एक दूसरे के पास आ रहे हैं। वे फिर जुड़ गए। पहले की तरह एक बड़ा चिकना-चमकीला गोला डूबता-उतरता हुआ लुढ़कता जा रहा था। सरकण्डे के झुण्डों के बीच से गुजरता हुआ मैं तटबन्ध से नीचे उतर आया। अचानक गोला छितर गया और उसमें से पांच सुन्दर जीवों की उत्पत्ति हो गई। क्या मैं मदारी का तमाशा देख रहा था या लोक कथाओं के छलावे की लीला ?

विविधि नाम— हिन्दी: ऊदबिलाव, संस्कृत: उद्रः, अंग्रेजी: स्मूथ इण्डियन औटर, (smooth Indian otter), लेटिन: लुत्रा पेर्सिचिल्लाता आई, जिओफ्रौय (Lutra perspicillata I. Groffroy)।

किलकारियां मारते हुए कलाबाज

चिकने जीव तैरने लगे। कभी वे सिमटकर गेंद बन जाते। एक की जगह अब पांच गेंदें तैर रही थीं। अचानक गेंदे लम्बी आकृतियों में बदल गईं जिनके चेहरे पिचके हुए थे। गंगा के स्फटिक जैसे नीले पानी में ये गोते लगाने लगे। इनके लचीले शरीर तरह-तरह की कलाबाजियां कर रहे थे। कभी ये प्राणी कुश्ती के दाव पेचों में व्यस्त हो

जाते-पंजों से एक-दूसरे पर प्रेम से वार करते। अत्यन्त मोहक तरीके से ये एक दूसरे का आलिंगन करते हुए चुम्बन लेते। किलकारियां मारते हुए वे अपने पैने दांतों से दूसरे साथी को पकड़कर शान्त पानी के नीचे धसीट ले जाते। कभी वे जोर से सीटियां बजाने लगते। कुछ देर बाद फिर वे एक दूसरे से आबद्ध होकर एक बड़ी गेंद के रूप में आ जाते। ये पांचों जीव अब मेरे इतना अधिक पास आ गए थे कि मैं इन्हें अच्छी

तरह पहचान रहा था। ये थे ऊदबिलाव के बच्चे जिन्हें पाठकों ने चिड़ियाघर में दर्शको का मनोरंजन करते देखा है।

लूट का माल खाने में अधिक मजा

ऊदबिलाव का बच्चा आसानी से पल जाता है। सैर के समय मालिक के साथ साथ कुत्ते की तरह चलता है। जैर्दन के पालतू ऊदबिलाव ने एक दिन सैर के समय एक दुकान से मछली उठा ली। मोपला छुड़ाने के लिए झपटा। इस पर ऊद लड़ने को उतारू हो गया। मामले को निपटाने के लिए जैर्दन ने मछली के दाम चुका दिए।

घर पर ऊद को भर पेट मछली दी जाती थी, परन्तु उसे लूट का माल खाने में अधिक मजा आने लगा था। बाजार से मछलियों की लूट रोजमर्रा की बात हो गई। रोज के उलाहने सुनकर जैर्दन संकोच में पड़ जाता था और उसे अक्सर मोपलों से मुंह मांगे दाम देने पड़ते थे। ऊदबिलाव अब उसके लिए सिरदर्द बन गया था। उसने इससे छुटकारा पाने का निश्चय किया।

आश्चर्यजनक तीक्ष्ण बुद्धि और आत्मीयता

एक बक्से में उसे बन्द कर दिया गया। कुछ समय तक उसे खाने को कुछ नहीं दिया। उसे लेकर जैर्दन एक डोंगी पर सवार हुआ और पश्चिम की ओर जल में बारह-तेरह किलोमीटर दूर निकल गया। तब उसने ऊदबिलाव को मुक्त कर दिया। वह भूखा तो था ही, आहार की तलाश में आगे बढ़ता गया। दृष्टि ओझल हो जाने पर जैर्दन ने तट से अपनी डोंगी छोड़ दी और एक नए रास्ते से घर लौट आया।

उसी सांझ घर से ढाई किलोमीटर दूर मोहर्रम के एक समारोह में जैर्दन को शामिल होना था। नौ बजे तक वह उसे देखने में

मशगूल रहे। उनके अचरज का ठिकाना न रहा जब कच्चे छप्पर के नीचे उन्हें अपना ऊदबिलाव आता दिखाई दिया। फर्श को पार करके पह सीधा उनके पैरों में आकर बैठ गया। ऐसी आश्चर्यजनक तीक्ष्ण बुद्धि और आत्मीयता की आशा कुत्ते से ही की जा सकती है।

ऊदबिलाव का मुख्य भोजन मछली है। यह कार्प, सालमन, पाइक, ईल, महशीर आदि अनेक प्रकार की मछलियों को खा जाता है। बहुत बार अपनी आवश्यकता से अधिक मछलियां मार लेता है। मछलियों के बढ़िया अंग खाकर घटिया हिस्सों को पानी के किनारें फेंक देता है। मछलियों की बहुलता हो तो, कहा जाता है कि, यह उनके दिमागों को ही खाकर सन्तुष्ट हो जाता है। बड़ी मछली को खाने के लिए पानी के बाहर धरती पर ले आता है। मछलियां न मिलें तो साग-सब्जी खाकर गुजर कर लेता है। पक्षियों को भी खा जाता है। अण्डों को तो चाव से खाता है।

महज खेल के लिए

चिल्का झील पर शिकार करते हुए ऊदबिलाव का रोचक विवरण मैक् मास्टर ने दिया है। झील के एक टापू पर उन्होंने ऊदबिलावों की एक टोली देखी। इसमें कम से कम छह जीव तो अवश्य थे। ऊदों ने टापू को छोड़ा और पानी में तैरने लगे। प्रकट रूप में उनका उद्देश्य मछलियां मारते हुए टापू तक या झील के किनारे तक जाना था। दोनों ही दूरियां तीन किलोमीटर से कम नहीं थी। एक छोटी डोंगी में बैठकर मैक् मास्टर आधी से अधिक दूरी तक उनके पीछे गए। एक दूसरे से लगभग पचास मीटर का फासला रखकर उन्होंने एक अर्द्धवृत्त बना लिया था। बीच में मछली का बड़ा झुण्ड था। बीच बीच में एक ऊदबिलाव गायब हो जाता। जब वह



उदविलाव परिवार



वयस्क उदविलाव

पुनः दिखाई देता तो अर्द्धवृत्त के बीच में आ जाता और मुख में एक मछली पकड़ी हुई होती। शिकार कने में अपनी दक्षता का प्रमाण देकर वह मछली को पानी में जिन्दा छोड़ देता। उसे ऊदबिलाव के पैसे दांतों की जरा खरोंच भी नहीं लगी होती।

पाठकों ने अक्सर देखा होगा कि चिड़ियाघरों में उदबिलाओ को जिन्दा मछली दी जाती है तो वे उसे एकदम नहीं मारते। एक बार दांतों में पोला-सा पकड़ने के बाद पानी के ऊपर आ जाते हैं। तब उसे छोड़ देते हैं। वह पानी में भागती है। उसका पीछा करके वे उसे फिर जिन्दा पकड़कर ऊपर आ जाते हैं। यह सब महज खेल के लिए किया जाता है।

मछुओं के लिए शिकार करते हैं

उड़ीसा, सुन्दरबन, जैस्सोर और सिन्ध में ऊदबिलावों को पालकर मछली के शिकार के लिए सधाया जाता है। इन्हें डोंगी पर बैठाकर ले जाते हैं। मछलियों का झुण्ड देखकर उन्हें छोड़ देते हैं। शिकारी कुत्तों के समान वे उनका पीछा करके उन्हें जाल की ओर खदेड़ लाते हैं। 1820 में बिशप हेबर ने अपने यात्रा वृत्तान्तों में लिखा था कि मत्ता कोल्ली के किनारे बांस के खूंटों के साथ लम्बी रस्सियों में नौ-दस खूबसूरत ऊदबिलाव बांधे हुए थे। शायद हेबर पूर्वी समुद्रतट की बात लिख रहे थे। मछियारे रस्सी में ढील देकर इन्हें तैराते थे। रस्सी के एक सिरे को मछियारे पकड़े रखते थे। उन्हें बताया गया था कि वहां अधिकतर मछियारों ने एक या दो ऊद पाल रखे थे जो कुत्तों की तरह पालतू बन गए थे और वे मछुओं के लिए मछली पकड़ने में उपयोगी थे। वे मुंह में मछली पकड़कर बाहर आ जाते थे। मुझे याद है कि लाहौर के चिड़ियाघर में ये इतने सध गए थे कि पानी में फेंके हुए सिक्के निकालकर अपने मालिक

को दे दिया करते थे। इस तरह अपने मालिक की रोजी कमाने में मदद करते थे।

मछवारों के पास अब सधाए हुए ऊद नहीं देखे जाते। ऊदों की खाल की कीमत ऊंची हाने से उन्हें मारकर खाल निकाल ली जाती है। पच्चीस खालों से एक जनाना कोट बनता है।

मोम का लचीला पुतला

इसका सम्पूर्ण शरीर मछली पकड़ने के लिए ढाला गया है। मोटे तौर पर शरीर की विशेषताएं हैं : जलरोधक मृदु लोम का धना आवरण, मोटी मांसपेशियों से युक्त पूंछ, पैडल सदृश पैर, अगले पैरों से पिछला पैर हमेशा बड़ा और कठोर गलमूँछों का अनुविन्यास। असल में पानी के अन्दर पता चलता है कि शारीरिक रचना किस तरह इसकी जीवन पद्धति के अनुकूल बैठती है। यह इतना लचीला होता है कि मछली का पीछा करते हुए मोम के पुतले की तरह सभी दिशाओं में आसानी से मुड़ जाता है। शिकार का पीछा करने के लिए प्रकृति ने इसे तेज गति प्रदान की है। सुवाही, लगभग बेलनाकार शरीर पानी में घुसने के लिए सुविधाजनक होता है और पानी के अन्दर तेजी से जाने के लिए कम प्रतिरोध पैदा करता है। खोपड़ी विशिष्ट प्रकार की बनी होती है। मस्तिष्क गुहा बहुत लम्बी और ऊपर से नीचे की ओर दबी रहती है चेहरा एकदम पिचका हुआ होता है। जो तैरते समय मुश्किल से ही नजर आता है। इसका लाभ यह है कि दुश्मन इसे आसानी से देख नहीं पाते। इसका तैरना बिलकुल अनायास और लोचपूर्ण होता है। धीमी चाल से जाता हुआ ऊदबिलाव केवल अगले पंजों को चलाता है। तेज रफ्तार में पिछले बड़े पंजे, शरीर तथा पूंछ भी कार्यरत हो जाते हैं। पिछले पंजों का जबर्दस्त संचालन शरीर की सर्पसदृश तरंगित गतियां और पूंछ ऊद को

तेजी से पानी में आगे धकेलती हैं। अंगुलियों के बीच में झिल्ली होने से पंजे शक्तिशाली पैडल बन जाते हैं। सुगठित मांसपेशियां, लम्बाई और चपटापन पूंछ को प्रभावशाली प्रणोदी (propeller) और चालन अंग बनाती है इससे ऊद झट गोता लगा लेता है और भागते हुए शिकार के सहसा मुड़ने पर या उसके बल खाने पर आसानी से उसका पीछा कर लेता है। पानी के नीचे ऐसे काम करने के लिए ऊद की देह बिलकुल फिट है। इसके छोटे व गोल कान और कपाटी से युक्त नथुने पानी को अन्दर नहीं धुसने देते।

बड़े बालों की गलमूँछे होने का लाभ भी हमें पानी के अन्दर मालूम पड़ता है। ये तार जैसी और मोटी मूँछे गीली हो जाने पर गिरती नहीं, अपितु तनी रहती हैं जिससे अनुभव करने का अपना कार्य भलीभांति सम्पादित करती रहें। पानी के नीचे दृष्टि कुछ धुंधली हो जाती है। उस कमी को गलमूँछों के कार्य से सहायता मिल जाती है पानी में डूबी हुई चट्टानों की दरारों के अन्दर छिपी हुई मछली को ऊद अपनी गलमूँछो के जरिए टटोलता या अनुभव करता है। पैर भी अनुभव करने के अंग के रूप में कार्य करते हैं। अत्यधिक संवेदनशील पंजों से ऊद निकर्दम में गड़ी हुई या पत्थरों के नीचे छिपी हुई मछली को और दूसरे शिकार को अनुभव करता है।

ऊद के दांत मजबूत और तीखे होते हैं। पिछले दांतों पर बहुत तेज-नोकदार उभार लगे होते हैं जो मछली के कठोर छिलकों को छेतने तथा फिसलते शिकार को मजबूती से पकड़े रखने में उपयोगी होते हैं।

ऊद के ऊपर जो लम्बे भूरे चमकीले बाल दीखते हैं उनके नीचे छोटे और मृदु रोमों का एक घना आवरण होता है जिस पर पानी का

असर नहीं होता। यह सरदी से ऊद की रक्षा करता है और तापमान एक समान बनाए रखता है।

मछली की बिखरी हुई हड्डियों तथा छिलकों से और झिल्लीदार पंजों की पद-पद्धति से पता चल जाता है कि इसका घर यहीं कहीं है।

गरमियों में बहुत से ऊद नदियों और नालों के साथ साथ ऊपर चढ़ते जाते हैं और हिमालय तथा कश्मीर में 3,660 मीटर की ऊंचाई तक पहुंच जाते हैं। ऊपर की ओर इनके परिव्रजन का कारण सम्भवतः कार्प और दूसरी मछलियों की गतिविधियों से सम्बन्धित है जो अण्डे देने की गरज से हिमालय में चली जाती हैं। शीत ऋतु के आगमन पर ये मैदानी नदियों में आ जाते हैं। एक नदी से दूसरी नदी तक की यात्राओं में इन्हें अधिकतर धरती पर चलना पड़ता है।

मछली न मिले तो ऊद, कंकड़े, मेंढक, घोंघे घास के टिड्डे, पानी के चूहे और जलमुर्गियां खा लेता है। अभाव में पत्ते और वनस्पतियों से प्राप्त अन्य आहार को भी खा जाता है। हंसक आदि पानी के पक्षी जब तैर रहे होते हैं तब उन्हें नीचे से आकर पकड़ लेता है। पानी के किनारों पर भी उन पर हमला करता है।

छोटे ऊद ने एक बैठक में चार किलो मछली खा ली

ऋषिकेश में लक्ष्मणझूला के ऊपर फूल चट्टी में एक शिकारी ने गंगा में से करीब बारह किलोग्राम की एक महाशीर तथा कुछ और मोटी मछलियों पकड़ी। मार्च का महीना समाप्त हो रहा था। मौसम में तेजी से गरमी आती जा रही थी। रात के खाने के लिए आवश्यक मछलियाँ रसोइए को सिपुर्द करके

शिकारी ने शेष मछलियों को धागों से बांधकर गंगा के बरफीले पानी में लटका दिया। शिकारी ने सोचा था कि बहता हुआ बरफानी पानी कोल्ड स्टोरेज का काम करेगा। इसमें सुबह तक मछलियां ताजा बनी रहेंगी। सुबह उठकर देखा तो छोटी दो मछलियां तो यथास्थान हैं, परन्तु बड़ी महशीर गायब हो गई हैं। शिकारी ने एक चट्टान पर चढ़कर इधर-उधर झांकां लगाओ अगली ऊंची शिला पर एक बड़ा ऊद बैठा था जो मछली को खा रहा था। कुछ क्षण दोनों ने एक दूसरे को देखा। फिर ऊद पानी में खिसक गया। शिला का एक सिरा पानी के अन्दर डूबा हुआ था। नदी में नीचे की तरफ बहते हुए बुलबुलों की एक रेखा से ऊद का पानी के नीचे जाने का मार्ग पता चल रहा था। वह महशीर को शिला पर ही छोड़ गया था। उसका पूरा सिर और एक बाजू खा गया था। शिकारी ने महशीर को तोला। वह आठ किलोग्राम थी। एक बैठक में उस छोटे जीव ने चार किलोग्राम मछली भकोस ली थी। एक युवा ऊद का भार बारह किलोग्राम के आस पास होता है। इस ऊद के भकोसेने के करतब की तुलना उस आदमी से की जा सकती है, जिसका वजन उनहत्तर किलोग्राम हो और वह एक ही बार में तेईस किलोग्राम भोजन खा जाए। कौर्बेट नेशनल पार्क में रामगंगा के तट पर एक बार ऊद के एक परिवार ने दस किलोग्राम की एक महशीर को एक ही बैठक में खाकर पंजर मात्र बना दिया था। ऊदों की खुराक बहुत अधिक है। उसे जुटाने के लिए उन्होंने हमारी अनेक नदियों में मछलियों की आबादी को अत्यधिक कम कर दिया है।

शिकार का आनन्द लेने के लिए

किसी नदी या झील में ऊदों की उपस्थिति का ज्ञान उनके आने जाने के मार्गों के अलावा चट्टानों पर पड़े मल से भी आसानी से हो जाता है। बहुत से स्तनपायियों

के समान इसकी भी हर रोज एक ही जगह मल विसर्जन करने की आदत है।

जिन जगहों पर मनुष्य परेशान करते हैं वहां ऊद रात को शिकार करते हैं। आदमियों का डर न हो तो वे शाम को शिकार खलेने में लग जाते हैं और सुबह देर तक खेलते रहते हैं। एक जोड़ा, एक परिवार, या कई परिवार मिलकर मछलियों के झुण्ड को घेर लेते हैं और उसे उथले पानी की ओर खदेड़ देते हैं। ऊद केवल खाने के लिए मछली नहीं मारता। वह शिकार का आनन्द लेने के लिए भी मारता है। मृगया के धूम धड़ाके और हो-हल्ले में जितनी मछलियां मारी जाती हैं उसका थोड़ा हिस्सा ही वास्तव में खाया जाता है। ऐसे कत्लेआम प्रायः तब होते हैं जब नदी मन्द बह रही हो और अवस्थाएं ऊदों के पूर्णतया अनुकूल हो।

प्रजनन

इनकी प्रजनन सम्बन्धी आदतों के बारे में निश्चित रूप से बहुत कम ज्ञात है। पकड़ी हुई मादा एक महीने के व्यवधान से साल भर गरमी में देखी गई है। पानी के अन्दर जोड़े बन सकते हैं। गर्भधारण काल लगभग इकसठ दिन या कुछ अधिक है। साल में एक बार किसी भी मौसम में दो या तीन बच्चे पैदा हो जाते हैं। पानी के किनारे खोदे हुए भट्ट में बच्चे दिये जाते हैं। किसी भी सूखी घास को भट्ट में बिछाकर उसके ऊपर इन्हें रखा जाता है। ऊद का घर कई सुरंगों से जुड़ा रहता है जिनके ऊपर अनेक प्रवेश द्वार होते हैं। एक रास्ता पानी के नीचे भी होता है। दो महीने के बाद बच्चे पानी में घुसना शुरू करते हैं। किनारे से कूदने, गोता लगाने और तरह तरह के खेल करने में इन्हें खूब आनन्द आता है। वे लुका-छिपी भी खेलते हैं। पूर्ण वयस्क हो जाने तक ये मां बाप के साथ रहते हैं।

सिर समेत शरीर पैसंठ से पिचहत्तर सेण्टीमीटर लम्बा, पूंछ चालीस से पैंतालीस सेण्टीमीटर लम्बी, भार सात से ग्यारह किलोग्राम। अच्छा पुष्ट नमूना सामान्य ऊद के ही आकार प्रकार का होता है। इसकी खाल नरम और चिकनी होती है।

यहां पाया जाता है

चरक ने पानी में रहने वाले स्तनपायी जीवों में ऊदबिलाव (उद) को गिनाया है (सू. 27; 40)।

हिमालय और सिन्ध से लेकर धुर दक्षिण तक; म्यांमार, इण्डोचीन और मलय में पाया जाता है। यह मैदानी ऊद है जो उत्तर पश्चिम के रेगिस्तान में, मध्य भारत के शुष्क क्षेत्र में और दक्षिण में पाया जाता है। पहाड़ों पर यह कम ऊंचाई तक जाता है। साधारण

ऊद के समान यह झीलों, नदियों, बड़े तालाबों और नहरों के किनारे रहता है। पानी भरे खेतों में, नालों में, खाड़ियों में और तट पर शिकार करता है। मछली के पीछे खुले समुद्र में चला जाता है। मध्य भारत की शुष्क भूमियों में जब जोहड़ और नदियां सूख जाती हैं तब ऊद झट बदले हुए हालात में रहने लगते हैं। धरती पर रहने वाले मांसाहारी प्राणियों के समान जंगल में शिकार करने निकल पड़ते हैं और पहाड़ियों के साथ बने भट्टों में रहने लगते हैं।

इनका शरीर भी यद्यपि पानी में जीवन यापन के लिहाज से बना है, परन्तु ये अन्य प्राणियों के समान धरती पर भोजन और पानी की तलाश में लम्बी यात्राएं कर लेते हैं। ये भी समूह में मछलियों मारते हैं।

उत्तरांचल के वन्य प्राणी

लेखक- जगदीश प्रसाद सती*

आदिकाल से देवभूमि के नाम से परिचित यह प्रदेश अपनी अकूत प्राकृतिक सौंदर्यता, हिमाच्छादित पर्वत श्रृंखलाओं, ऊँची-ऊँची चोटियों, रमणीक बुग्यालों, घने जंगलो, स्वच्छ तालाबों, झर-झर करते झरनों, निर्मल नदियों, सीढ़ीनुमा खेतों, फलदार बगीचों, विस्तृत भाबर, छोटी छोटी शिवालिक पहाड़ियों, सज्जन निवासियों आदि के साथ-साथ यहाँ पाये जाने वाले वन्य प्राणियों के लिये भी प्रख्यात रहा है। प्रदेश के क्षेत्रफल (53000 वर्ग कि०मी०) का लगभग 63 प्रतिशत भाग वन क्षेत्र है जो इसमें रहने वाली प्रजातियों के लिये उपयुक्त पारिस्थितिकी उपलब्ध कराता है समूचे वनक्षेत्र का लगभग 4300 वर्ग कि०मी० क्षेत्र (14 प्रतिशत) आरक्षित श्रेणी में रखा गया है। प्रदेश के राष्ट्रीय उद्यान, कॉर्बेट (520 वर्ग कि०मी०) तथा राजा जी (824 वर्ग कि०मी०) इनमें पाये जाने वाले हाथियों, टाइगर, पैंथर, भालू, नीलगाय, हिरण, सुअर, बंदर, लंगूर आदि अनेक प्रजातियों को सुरक्षा प्रदान करते हैं। नंदादेवी जीव परिमण्डल (630 वर्ग कि०मी०) एकमात्र परिमण्डल है जो इसमें पाये जाने वाले हिमबाघ, भालू, थार, भराल, सिराऊ, कस्तूरीमृग, हिम मुर्गा, मोनाल, आदि अनेक पशु पक्षी प्रजातियों को सुरक्षा प्रदान करता है। फूलों की घाटी (87 वर्ग कि०मी०), केदारनाथ (967 वर्ग कि०मी०), गोविन्द

पशु विहार (957 वर्ग कि०मी०) तथा अस्कोट (284 वर्ग कि०मी०) वन्य जीव अभयारण्य, इनमें पायी जाने वाली हिम बाघ, बाघ, कस्तूरी मृग, भालू, भराल, सेराउ, थार, बिजू, सांभर, काकड़, हिममुर्गे, मोनाल, तीतर, बटेर, कलील, आदि कई प्रजातियों को सुरक्षा एवं प्रजनन की पारिस्थितिकी प्रदान करते हैं।

भारत में स्तनधारी वन्य प्राणियों की कुल प्रजातियों की संख्या (लगभग 395) का लगभग 25 प्रतिशत इस प्रदेश में पायी जाती है। इनके अतिरिक्त पक्षियों, विसर्पी, मच्छलियों व अन्य प्रकार के कई प्राणी प्रजातियाँ भी इस प्रदेश में पायी जाती हैं। दुर्गम एवं संसाधनों की कमी के कारण यह क्षेत्र अभी भी अपरीक्षित है। प्रदेश में आज भी वैज्ञानिक सर्वेक्षणों, अनुसंधानों एवं खोजबीन की अपार संभावनायें हैं। यहाँ के वन्य प्राणियों के विषय में आज तक किये गये सर्वेक्षणों एवं खोज बीन के आधार पर कुछ प्रजातियों के वर्गीकरण के आधार पर जानकारी दी जा रही है।

वर्ग- काइरोप्टेरा

1. चमगादड़ (बैट) : एक मात्र उड़ने वाले स्तनधारी प्राणि है जो रात के अंधरे में अपना भोजन करते हैं। सांय होते ही इनकी जीवन प्रक्रिया प्रारम्भ हो जाती

* भारतीय प्राणि सर्वेक्षण, देहरादून।

है। और सुबह होने से पहले ही पेड़ों व गुफाओं में उलटे लटक जाते हैं। भोजन में ये अधिकांशतः फलों एवं कीट-पतंगों का सेवन करते हैं। प्रदेश में इनकी लगभग 20 प्रजातियाँ पायी जाती हैं।

वर्ग— प्राइमेट्स

2. बंदर (ऋसस मकैक) : लगभग संपूर्ण प्रदेश में पायी जाने वाली यह प्रजाति हिमालयी क्षेत्र में 2500 मी० की ऊँचाई तक पायी जाती है। यह सामाजिक समुदाय में रहते हैं जिसका कि नर बंदर मुखिया होता है। एक समुदाय में इनकी संख्या 10-80 तक हो सकती है। ये मुख्यतः फल, फूल, पत्तियों व अनाज का भोजन करते हैं। गाँव-देहात, बल्कि आजकल शहरों में भी फसलों एवं बगीचों को नुकसान पहुँचाते हैं। हिन्दू समाज में इन्हें भगवान हनुमान के नाम से पूजा भी जाता है और इसी संदर्भ में इन्हें फल, लड्डू एवं अनाज आदि खिलाया जाता है।

3. लंगूर (कॉमन लंगूर) : हनुमान लंगूर के नाम से भी जाने जाने वाली यह प्रजाति लगभग समूचे प्रदेश में पायी जाती है। हिमालयी क्षेत्र में यह बंदर से अधिक ऊँचाई वाले क्षेत्रों में पायी जाती है। भूरे रंग, काले मुँह व लम्बी पूँछ वाली यह प्रजाति भी समुदाय में रहती है। एक समुदाय में नर, मादा, वयस्क व बच्चे होते हैं। बंदर की भाँति यह भी शाकाहारी तथा फसलों आदि का नुकसान करते हैं।

वर्ग— फोलिडी

4. पैंगोलिन (इंडियन पैंगोलिन) : मैदानी एवं भाबर के जंगलों में पायी जाने वाली यह प्रजाति अधिकांशतः जमीन के

अंदर सुरंग बनाकर रहती हैं। भोजन में दीमक एवं चींटियों का सेवन करते हैं। इसी कारण इन्हें ऐन्टईटर के नाम से भी जाना जाता है। इनके शरीर का बाहरी आवरण मजबूत कवचनुमा होता है जो बाहरी शत्रुओं से इनकी रक्षा करता है।

वर्ग— कार्निवोरा

5. गीदड़ (जैकॉल): अधिकतर जंगलों तथा उसके आस पास की बस्तियों के नजदीक पाये जाते हैं। हिमालय क्षेत्र में ये लगभग 2300 मी० की ऊँचाई तक ही पाये जाते हैं। इनका मुख्य भोजन मरे हुये जानवरों का मांस व छोटे जानवर हैं। ये सांयकाल में कभी कभी ऊँचे स्वर में आवाजे भी करते हैं।

6. लोमड़ी (फॉक्स) : लगभग समूचे प्रदेश में मैदानी जंगलों से लेकर हिमालय क्षेत्र तक पायी जाती है। इसके शरीर पर घने बाल तथा पूँछ लम्बी होती है। भोजन छोटे जानवरों, मुर्गे व पक्षियों का करते हैं, बस्तियों में मुर्गे चुराकर खाने के लिये यह प्राणि मशहूर है।

7. भूरा भालू (बाउन बियर): अधिकांशतः बर्फीले क्षेत्र में ही रहते हैं, लेकिन शीतकाल में भोजन की खोज में तलहटी क्षेत्र में भी भ्रमण करते हैं। ये शाकाहारी होते हैं। इस क्षेत्र में इनकी वास्तविक संख्या का अनुमान लगाना मुश्किल है लेकिन लगभग पूरे हिमालयी क्षेत्र में पाये जाते हैं।

8. काला भालू (हिमालयन ब्लैक बियर): संपूर्ण हिमालयी क्षेत्र में लगभग 3600 मी० की ऊँचाई तक पाये जाते हैं। छाती में सफेद रंग के V नूमा बालों का चिन्ह काले बालों में अलग से पहचान

रखता हैं। ये रात्रिचर एवं शाकाहारी होते हैं। परन्तु कभी-कभी मरे हुये जानवरों को भी खा लेते हैं। पहाड़ों में फसलों एवं यदा कदा मनुष्यमात्र को भी नुकसान पहुँचाते हैं। इन्हें चिड़ियाघरों में भी देखा जा सकता है।

9. चितरॉल (एलोथोटेट मार्टिन): हिमालय क्षेत्र में लगभग 2700 मी० की ऊँचाई तक पाया जाता है। जबड़े के पीले रंग के बाल, गहरे भूरे तथा काले रंग के शरीर के बालों में अलग ही चमकते हैं जैसा कि इसके नाम से विदित हैं मधुमखियों के छत्ते व शहद इनका मुख्य भोजन है ये पेड़ों, मकानों व पहाड़ों में आसानी से चल लेते हैं। इसकी लम्बे बालों वाली झाड़ूनुमा पूँछ होती है। ये अक्सर जोड़े में रहते हैं।

10. छोटा चितरॉल (व्हीजल) : घने जंगलों तथा पानी वाली खुली जगहों में रहने वाली यह प्रजाति हिमालय क्षेत्र में 1500-4800 मी० की ऊँचाई तक पायी जाती हैं। इनका भोजन पक्षियाँ व उनके अण्डे हैं। इसके कान छोटे व शरीर का रंग लाल भूरा व हल्का काला होता है।

11. बीजू (सीवट कैट) : बिल्लीनुमा, गहरे रंग की यह प्रजाति लगभग पूरे प्रदेश में पायी जाती है। इसके शरीर का आकार छोटा तथा पूँछ व शरीर की लम्बाई लगभग समान (18 इंच के लगभग) होती है। भोजन की खोज में रात को विचरण करते हैं। मुर्गे एवं दूसरे कई पक्षी इनका भोजन हैं। बस्तियों में आकर पालतू मुर्गे-मुर्गियों का शिकार भी करते हैं। इस क्षेत्र में इनका तीन प्रजातियाँ मिलती है।

12. नेवला (मैंगूज) : मुलायम चमकदार भूरे रंग के बालों, तथा लम्बी पूँछ वाला यह प्राणि मैदानी क्षेत्र में पाया जाता

है। पहाड़ों में कम ऊँचाई वाले इलाकों में भी पाया जाता है। ये जमीन में सुरंग बनाकर रहते हैं। सांप, चूहे इत्यादि इनके मुख्य भोजन हैं। इस क्षेत्र में इनकी दो प्रजातियाँ मिलती हैं।

13. जंगली बिल्ली (जंगल कैट) : अधिकतर जंगलों तथा जंगलों के साथ लगे गाँवों एवं बस्तियों के आस पास पायी जाती है। यह कद में घरेलू बिल्ली से बड़ी व तेन्दुवे से छोटी होती है। भोजन के लिये अपने से छोटे जानवरों तथा पक्षियों का शिकार करती है। यह हिमालय में ऊँचाई वाले क्षेत्रों के अलावा समूचे प्रदेश में पायी जाती हैं।

14. बाघ बिल्ली (लैपर्ड कैट) : लगभग पूरे प्रदेश में पायी जाती है तथा घने जंगलों, पहाड़ों व बस्तियों के आस पास रहती है। कद में जंगली बिल्ली से बड़ी व बाघ से छोटी होती हैं। इसके शरीर में भूरे या काले भूरे चकत्ते होते हैं। छोटे जानवर और पक्षी इसके मुख्य भोजन हैं।

15. तेंदुआ (लैपर्ड या पैन्थर) : घने जंगलों तथा खुले क्षेत्र में रहने वाली यह प्रजाति लगभग समूचे प्रदेश में पायी जाती है। इसका मुख्य भोजन जंगली जानवर विशेषकर हिरण प्रजातियाँ हैं। कभी कभी मवेशियों का शिकार भी करते हैं। यदा कदा आदमखोर भी बन जाते हैं। यह अनुमान लगाया जा रहा है। कि वृद्ध तेंदुआ जो शिकार करने में सक्षम नहीं रह जाते वे आदमखोर बन जाते हैं।

16. बाघ (टाइगर) : मैदानी व भाबर के जंगलों से लेकर हिमालय क्षेत्र में 3500 मी० की ऊँचाई वाले क्षेत्र तक पाये जाते हैं। यह भी तेंदुये की तरह मासाहारी प्राणि है। ये कॉर्बेट व राजाजी राष्ट्रीय उद्यानों में

अच्छी संख्या में मिलते हैं क्योंकि ये उद्यान इन्हें उचित पारिस्थितिकी प्रदान करते हैं।

17. हिम बाघ (स्नो लैपर्ड) : मुख्यतः हिमालय में हिमाच्छादित क्षेत्रों में पाये जाते हैं। यह दूधिये भूरे रंग तथा भूरे रंग के चकते वाला तेंदुआ है जो कभी-कभी ही दिखायी देता है। इसका भोजन इस क्षेत्र में पाये जाने वाले जानवर जैसे-भराल, थार कस्तूरी मृग इत्यादि हैं। अपने शिकार के साथ-साथ ये भी हिमालयी क्षेत्र में ऊपर-नीचे विचरण करते हैं। शीतकाल में अन्य जानवरों की भांति ये भी निचले इलाकों में चले जाते हैं। इनकी संख्या या गणना का अनुमान लगाना कठिन है।

वर्ग- प्रोबोसिडी

18. हाथी (इंडियन ऐलीफैंट या भारतीय हाथी) : प्रदेश के मैदानी, तराई एवं भाबर क्षेत्रों में पाये जाते हैं। कॉर्बेट एवं राजाजी राष्ट्रीय उद्यान इन्हें उपयुक्त पारिस्थितिकी प्रदान करते हैं। यही कारण है कि इनमें इनकी अच्छी संख्या है। ये अधिकांशतः झुण्ड में रहते हैं लेकिन यदा-कदा अकेले भी विचरण करते हैं। इनके झुण्ड में नर, मादा, वयस्क एवं बच्चे होते हैं। इनके विचरण के मार्ग में यदि फसलें आदि आ जाती हैं तो उसका नुकसान भी करते हैं। हाथी दांत की विश्व बाजार में बढ़ती मांग को देखते हुये आये दिन इनका शिकार हो रहा है जिससे इनका अस्तित्व खतरे में पड़ गया है।

वर्ग- आर्टियोडैक्टाइला

19. जंगली सुअर (वाइल्ड बोर) : घने जंगलों, खुले घास के मैदानों, पानी के श्रोतों आदि के पास रहते हैं। प्रदेश में हिमाच्छादित क्षेत्र के अलावा सभी जगहों में पाये जाते हैं। ये मुख्यतः भूमिगत तनों,

जड़ों आदि का भोजन करते हैं। आलू, अरबी, शक्करकंदी, आदि फसलों को नुकसान पहुँचाते हैं क्योंकि ये इनके प्रिय भोजन हैं।

20. कस्तूरी मृग (मस्क डियर) : कस्तूरी के लिये प्रसिद्ध, छोटे कद का यह मृग बुग्याल व इससे सटे जंगलों तथा हिमाच्छादित क्षेत्रों में पाया जाता है। शीतकाल में इनका भोजन (घास/वनस्पति) बर्फ से ढक जाता है और ये भोजन की खोज में निचले इलाकों में चले जाते हैं। कस्तूरी (मस्कपॉड) की बढ़ती मांग के कारण आये दिन इनका शिकार होता है, जिस कारण इनकी संख्या दिन प्रतिदिन कम होती जा रही है। प्रदेश के चमोली जनपद में इनके प्रजनन एवं विस्तार के लिये, कांचूला खरक में सरकार की ओर से एक फार्म बनाया गया है।

21. काकड़ (बारकिंग डियर) : लाल भूरे रंग, लगभग 60 से 100 कद वाला यह मृग मैदानों से लेकर 2500 मी० तक की ऊँचाई वाले क्षेत्र में पाया जाता है। ये कुत्ते की जैसी आवाज करते हैं। घने जंगल तथा उनसे लगे छोटे घास के मैदान इनके पसंदीदा क्षेत्र हैं, जहां इन्हें अधिकतर देखा जाता है। शिकारियों का पसंदीदा शिकार होने के कारण इनकी संख्या काफी कम हो गयी है।

22. चीतल (स्पोटेड डियर) : हिमालय की तलहटी, भाबर, तराई, शिवालिक तथा मैदानी क्षेत्रों में अधिकांशतः पाये जाते हैं। कॉर्बेट एवं राजाजी राष्ट्रीय उद्यानों में ये अच्छी संख्या में पाये जाते हैं। खुले घास के मैदानों में रहना पसंद करते हैं। ये बड़े बड़े झुण्ड में रहते हैं तथा तेन्दुए एवं बाघ के आसान शिकार हैं।

23. **पाड़ा (हॉग डियर)** : कद में छोटा, यह मृग शिवालिक एवं मैदानी क्षेत्रों में पाया जाता है। इनकी संख्या में कमी आ जाने के कारण यह कभी-कभी ही दिखाई देते हैं। भारतीय मृग समुदाय में यह सबसे छोटे कद का मृग है।

24. **सॉबर** — पहाड़ी क्षेत्र में जड़ाऊ के नाम से भी जाना जाता है। हिमालय क्षेत्र में यह लगभग 3000 मी० की ऊँचाई तक पाये जाते हैं। भारी भरकम शरीर तथा लम्बे व मजबूत सींगों वाला यह सबसे बड़ा मृग है। यह अधिकतर घने जंगलों से रहता है। यहाँ के राष्ट्रीय उद्यानों एवं अन्य जंगलों में अभी भी अच्छी संख्या पाये जाते हैं।

25. **नीलगाय (नील गाय या ब्लूबुल)**: अधिकांशतः मैदानी क्षेत्र में ही पाये जाते हैं। ये खुले घास के मैदान व छितरे जंगलों में रहना पसंद करते हैं। घने जंगलों से दूर ही रहते हैं। यदा-कदा फसलों को भी नुकसान पहुँचाते हैं।

26. **सिराऊ** : बकरीनुमा यह प्रजाति हिमालय क्षेत्र में 1850 मी० से 3000 मी० की ऊँचाई तक पायी जाती है। इसे जंगली बकरी भी कहा जाता है। अधिकांशतः घने जंगलों में रहते हैं।

27. **घुरल (गोराल)** : बाहरी हिमालय क्षेत्र में 600 मी० से लेकर लगभग 2000 मी० तक की ऊँचाई वाले क्षेत्रों में पाया जाता है। बकरीनुमा व सिराऊ से छोटे कद का होता है। चीड़ व बाँज के वनों में पाये जाते हैं, अधिकांश चट्टानों इलाकों में रहते हैं।

28. **थार (हिमालयन थार)** : हिमालय क्षेत्र में 250 मी० से 3000 मी० की ऊँचाई वाले इलाके में पाया जाता है। बुग्याल एवं

पहाड़ी ढलान वाले क्षेत्रों में अधिक देखे जाते हैं। शीतकाल में निचले व ग्रीष्म ऋतु में उपर के इलाकों में भ्रमण करते हैं।

29. **भराल (ब्लूशीप)** : जंगली भेड़ या भरड़ के नाम से भी जाना जाता है। हिमालय में 3500-4800 मी० ऊँचाई तक पाये जाते हैं। बुग्याल एवं पहाड़ी ढलान वाले स्थानों में अधिक दिखायी पड़ते हैं। ये अधिकतर बड़े बड़े समुदायों में दिखाई देते हैं।

वर्ग— रोडेंसिया

30. **उड़न गिलहरी (फ्लाइंग स्क्वीरल)** : पहाड़ी जंगलों में पायी जाने वाली यह गिलहरी, तुलराय के नाम से भी जानी जाती है। इनके शरीर की बनावट इन्हें उड़ान भरने या ग्लाइड करने में मदद करती है। ये केवल पेड़ों के उपर ही उड़ती दिखाई देती हैं। इसके शरीर में गहरे भूरे रंग मिश्रित बाल होते हैं। फल, फूल इत्यादि इनके भोजन हैं।

31. **गिलहरी (कॉमन पांम स्क्वीरल)**: अधिकांशतः मैदानी क्षेत्रों में पायी जाती है। खेत-खलिहान, बाग-बगीचे, जंगल आदि सभी जगह इन्हें देखा जा सकता है। फूल, बीज, पत्तियाँ आदि इनके भोजन हैं। इनके शरीर में भूरे व हल्के पीले रंग की धारियाँ सर से पूँछ की तरफ बनी होती हैं।

32. **सेही (इंडियन पॉक्यूपाइन)** : मैदानी क्षेत्र में हिमालय में 3000 मी० की ऊँचाई तक पाये जाते हैं। शरीर में काले-सफेद रंग के नुकीले कॉटे (क्वील्स) होते हैं जो दुश्मनों से इनकी रक्षा करते हैं। भोजन में भूमिगत तने, जड़ों आदि का प्रयोग करते हैं।

33. **चूहा (रैट)** : इनकी कई प्रजातियाँ पायी जाती हैं। ये सभी आवासीय जगहों से

लेकर जंगलों तक पाये जाते हैं। ये फसलों, भंडारों, घरेलू वस्तुओं को नुकसान पहुँचाते हैं। इनकी 14-15 प्रजातियाँ मिलने के प्रमाण हैं।

34. **छुछन्दर (माउस)** : लगभग समूचे प्रदेश में पाये जाते हैं। राख जैसे भूरे बाल तथा लम्बा मुँह वाला यह प्राणि घरों में काफी गंदगी फैलाता है। प्रजनन के बाद छोटे बच्चे माँ की पूँछ के सहारे लम्बी कतार बनाकर चलते हैं। प्रदेश में इनकी लगभग 4-5 प्रजातियाँ पायी जाती हैं।

वर्ग—लेगोमॉफी

35. **खरगोश (इंडियन हेयर)** : लगभग पूरे प्रदेश में पाया जाता है। हिमालय क्षेत्र में कम ऊँचाई वाले स्थानों में पाये जाते हैं। रात्रिचर होने के कारण अंधेरे में खुले स्थानों में अधिक देखे जाते हैं।

इसके लम्बे कान व दुबका शरीर इसकी विशेषता है।

36. **पहाड़ी खरगोश (रायल्स पाइका)** : माउस हेयर के नाम से भी जाना जाता है। हिमालय में 3400 मी० से 4400 मी० की उंचाई तक पाये जाते हैं। यह बिना पूँछ वाली प्रजाति है। इसकी पूँछ नहीं के बराबर होती है। इसलिये यह अपनी अलग पहचान बनाये रखता है। शरीर में छोटे-2 गोलाईनुमा कान होते हैं।

इस अमूल्य वन्य प्राणि संपदा के संरक्षण की आवश्यकता है। समस्त प्रदेशवासियों का पुनीत कर्तव्य है कि इस बेजोड़ संपदा का रख-रखाव करें और प्रदेश को इस क्षेत्र में प्रथम स्थान दिलायें ताकि हमें अपनी प्राणि संपदा पर गर्व हो।

Save India's Last Environment

By

Bulu Imam*

Today the threat to our forest is from the State and not the people who live in villages adjacent to, and sometimes in, the forest areas. The development projects which the state has repeatedly targeted in mineral or hydel rich areas have completely destroyed the Indian countryside, specially in the past half century of our independence as a nation. This is indeed most unfortunate. Not a strong enough statement has been made against this destruction of wildlife habitat which, although destroying the habitat for the survival of the large fauna such as the tigers and elephants, has ruined the natural existing ecosystems of the most complex order of natural wildlife.

The forest people have been every where targeted as the enemies of the forests which is farthest from the truth, since it is infact these simple societies that have been the custodians of our forests for millennia long before the Mughals established tribute or the British established land title. Some uniformed persons have opinioned that the tribal have never *possessed* the wildlife of India. This is most untrue, since we find wild animals as the most important subject illustrated by the pre-historic rockart throughout India, and we must not in our drunken state of the power and economy-hunger forget that the wildlife of India belongs first and foremost to the people of India.

In my state of Jarkhand during my lifetime in the past sixty years I have seen once beautiful old-growth forests stripped and vandalized by so called Development projects, in particular (i) Damodar Valley Cooperation (ii) Coal India coal mines project. This is most unfortunate indeed that the architects of modern Indian could plan the systematic whole sale destruction of our forests and rivers in the name of Development. It is, indeed, most unfortunate. Today, the entire lower Damodar valley has been destroyed by large coal mines and large dams, not only in the rivers but in the valleys of its tributaries as well (i.e. Barakar, Bokaro, Konar etc.) We have been a patient and believing, not to say long suffering population. We have seen this immense destruction being passed off in the name of Development like some kind of holy writ, to be believed in and accepted without any sort of protest. How many Sunderlal Bahugunas and Baba Amtes and Medha Patkars, Billy Arjun Singhs, Bittu Sahgals, Valmik Thapars have we as a nation of a billion people produced ? Not many. This is both frightening and sad. It is frightening because it shows not enough

care. We have become a nation of lip servers. It is the effect of our national brow beating by our erstwhile colonial masters no doubt. Are we going to let it continue.

Today the last remaining forested wildlife corridors of elephants and tigers between Hazaribagh, Ranchi, Chatra and Palamu, in the upper valley of the Damodar river, are being threatened by open cast coal mines in the terribly destructive North Karanpura Coalfield Project which I have been steadily campaigning against ever since 1987.

Our Thousand Tigers Ecosystem campaign may be found on the internet at www.web.net/~pcarter/hazaribagh. Over seventy opencast coal mines are being launched to destroy a vital natural ecosystem which is one of the greatest natural heritages of this once great nation. I am deeply ashamed and I wish to share this deep shame with all 'Cheetal' readers as contributor to this prestigious journal ever since 1958.

The once clear-flowing Damodar river ran swiftly through green mountains and original old-growth sal forests filled with Sambar, tiger, leopard and herds of migratory bison and elephants not so long ago. Today huge mines over three hundred feet deep have gouged open these green wildlife corridors (Ashoka, Piperwar OCP's) and threaten still more (Magadh, Amrapalli proposed OCP's). Two hundred and more tribal villages and their forest environs stand threatened. Due to the presence of Permian deposits of coal the NKCP area has the highest concentration of lead (300 parts per million), and the high presence of arsenic, iron, chromium, manganese, etc. in the sediments and surface rivulets flowing through Dakra and Karkata are a life threat to residents along the river's banks. All these poisonous chemicals are present well above tolerance levels (Dr. Nitish Priyadarshi, Principal investigator, dept. of Geology, Ranchi. This is a blot on the State.

I appeal to all 'Cheetal' members to voice out their opinions much more vociferously and audibly, using the principle that we will not countenance any further destruction to India's forests and biodiversity even in the name of Development, because we can never put back the loss of biodiversity. This has to be taken as a campaign of information to every Indian child in classrooms throughout the country. It is no use speaking on behalf of conservation or planting trees such as urban-based environmentalists have so far been indulging in. We who live in the jungle areas where the real damage is being done are not of the view that such goody campaigns are either adequate or justifiable where the State is allowed to go on destroying one pristine eco-habitat after another in the name of Development. We must not any longer countenance State sponsored destruction of the environment and this information must be taken to every classroom in India and every Indian child must be made aware that we elders are destroying their environment for our present use and purposes in the name of Development. Will they agree to it?

बधाई

श्री रामेश बेदी का सम्मान

वयोवृद्ध, ज्ञानधन, आयुर्वेद के सुविख्यात विद्वान् श्री रामेश बेदी आयुर्वेदालंकार को चरकसंहिता के जीव-जन्तु पुस्तक पर हिन्दी अकादमी, दिल्ली द्वारा कृति-सम्मान तथा प्रशस्तिपत्र प्रदान किया गया।

हिमालय की दुर्गम घाटियों तथा भारत के नेशनल पार्कों और अभयवनों में वन्य जीवों का प्रत्यक्ष ज्ञान प्राप्त कर श्री बेदी ने चरकसंहिता में उल्लेख किए गए 44 स्तनपायियों, 43 पक्षियों, 16 सरीसृपों और 12 क्षुद्र जीवों का परिचय दिया है। जीव-जन्तुओं का प्रत्यक्ष ज्ञान कराने के लिए 120 सादे तथा रंगीन फोटो दिए हैं।

श्री बेदी की लेखन शैली रोचक है। पुस्तक पढ़ते समय महसूस होता है कि जानवर के साथ साथ पाठक खुद जंगल में घूम रहा है। पढ़ने में उपन्यास जैसा रस आता है।

हिन्दी अकादमी द्वारा सम्मानित करने पर हम श्री बेदी का हार्दिक अभिनन्दन करते हैं।

Wildlife Preservation Society of India

1. The aims and objects of the Society are as follows :-

- (a) To promote interest and impart knowledge regarding the preservation and conservation of all forms of wildlife, particularly among the youth of the country.
- (b) To cooperate with the Govt. of India and State Governments and with others Societies and Institutions having similar aims and objects in working for the interests of wildlife.
- (c) To assist in enforcing and actively supporting the Forests Acts, Wild Birds and animals Protections Acts and Rules etc. of State Governments and the Indian Arms Act and Rules in so far as they pertain to wildlife and to bring to the notice of the authorities any infringement of the same and to assist in the detention and prosecution of offenders in respect of such laws.
- (d) To advise and help the Govt. and wildlife administrators in the formation, maintenance and protection of Sanctuaries and National Parks, preservation of wildlife in general and endangered species of india in particular and in the introduction of exotic species into the country, rehabilitation of endangered species etc. and in the formulation and amendments of rules and acts, so as to conserve and increase wildlife stocks.
- (e) To raise funds for carrying out the above aims and objects and to found and maintain museums, reading rooms and libraries of natural history in order to disseminate knowledge regarding wildlife.
- (f) To carry out publicity and propaganda for the preservation of wildlife in India by means of monographs, journals, films, filmstrips and other feasible methods.
- (g) To assist members of the Society in obtaining facilities for viewing and photographing wildlife in India.
- (h) To conduct research into the problem of Wildlife management in India, and in pursuance of this, to initiate, encourage and, where possible assist in the projects for the study of threatened species and related objects and to provide reference and reserch facilities for such work.
- (i) To carry on such other activities which will serve the above subjects.

2. What membership of Wildlife Preservation Socitiei of India will entitle you to?

- (1) You will become an active member of the growing group of Wildlife enthusiasts, who enjoy working for and spreading the knowledge of how to conserve India's heritage of wildlife for posterity
- (2) You will be entitled to the full use of the library of the Wildlife Preservation Society and of its reading room.
- (3) You will receive a membership certificate.
- (4) You will receive a personal Identification and Membership Card.
- (5) You will be entitled to buy all publications of the Society at a concessional rate
- (6) You will be entitled to buy at concessional rates the Societies Greeting Cards, Calendars, Tie, Lapel badges and the Balance of Nature Game (specially Published in colour for its educative and recreational values).
- (7) You will be supplied "Cheetal", the quartely journal of the society free.

3. For membership particulars write to Honorary Secretary, Wildlife Preservation Society of India, 7 Astley Hall, Dehra Dun.

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